Dell™ Technology Guide

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

Steps pertaining to *Microsoft*® *Windows Vista*® and *Windows*® *XP* refer to *Windows Vista Ultimate* and *Windows XP Professional* edition respectively in **default** view.

NOTE: Steps may vary depending on the version of operating system installed on your computer.

represents Windows Vista Start button.

represents Windows XP Start button.

August 2008 **Rev. A01**

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1

Finding Information

Start Button

From the Microsoft® Windows® operating system desktop, you can click the Start button to access resources, programs, and specialized tools for managing the way Windows appears and functions on your computer.

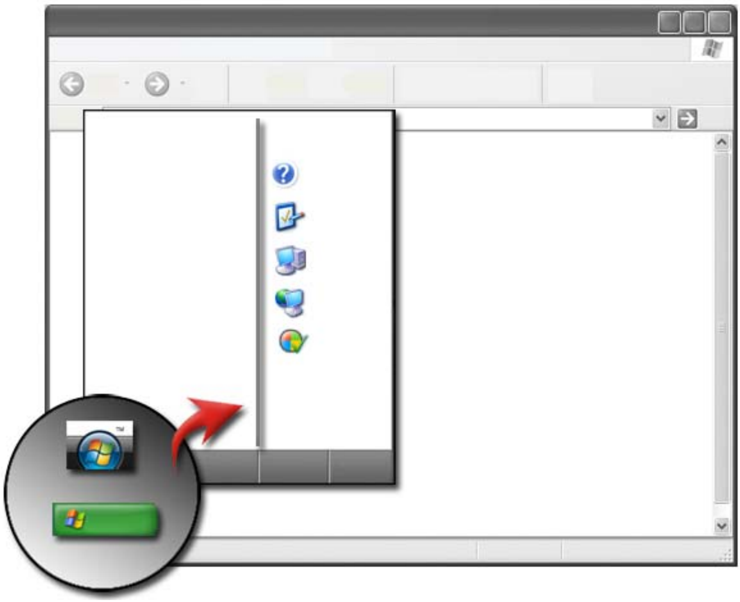
The Start button may differ in appearance depending on the version of Windows, but it is consistently located on the left side of the Windows taskbar.



From the Start button menu, you can access:

- Microsoft Windows Help and Support
- Control Panel
- Information About Installed Hardware
- Device Manager
- Programs Installed on Your Computer
- Wireless Networking
- Dell Support Website

Microsoft Windows Help and Support



This information center provides instructions, hints, and general information about Microsoft Windows and explains how to use available features. It also provides access to documentation for your computer and devices installed on your computer. To access Windows Help and Support:

1 Click **Start**  or  → **Help and Support**.

2 Click the topic or task you want to perform.

3 If the specific task is not listed, use the search option.
In the **Start Search** field (or **Search** in Windows XP), type a word or phrase that describes your question, and then press <Enter> or click the arrow or the magnifying glass.

4 Click the topic that describes your question.

5 Follow the instructions on the screen.

Windows Vista®

Basic Computer Information

Click **Start** → **Control Panel**→ **System and Maintenance**→ **System** to view your computer information.

Windows® XP

User's Guides

To view the user's guides available on your computer, click **Start** → **Help and Support**→ **Dell User and System guides** (from the **Pick a Topic** options).

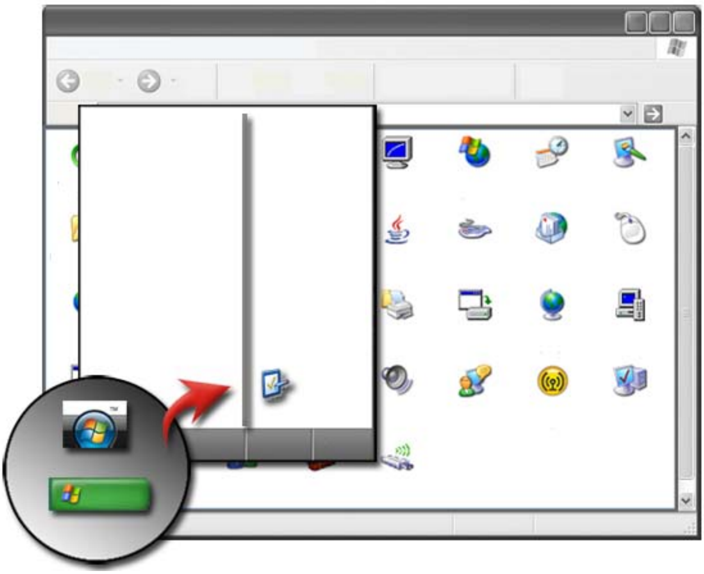
Basic Information

Click **Start** → **Help and Support**→ **Tools** (from the **Pick a Task** options) to view your computer information and to diagnose problems.

You can also view more details about your computer through the Control Panel (see "Control Panel" on page 26).

Control Panel

To manage viewing features and computer functions, click **Start** or → **Control Panel**.



FOR MORE INFORMATION: See Windows Help and Support: click Start or → **Help and Support**.

Information About Installed Hardware

Device Manager

Use the Device Manager to view a list of all devices installed on your computer and to learn more about how a specific device is configured.

Windows Vista®

Click **Start** → **Control Panel**→ **System and Maintenance**→ **System**→ **Device Manager** (listed under **Tasks**).

Windows® XP

Click **Start** → **Control Panel**→ **Performance and Maintenance**→ **System**→ **Hardware** tab→ **Device Manager**.

> **FOR MORE INFORMATION:** To learn more about your computer's hardware components, see the **View your computer information topic** in Windows Help and Support: click **Start** or → **Help and Support**.

Hardware Devices Installed on Your Computer

Click **Start** or → **All Programs**→ **Accessories**→ **System Tools**→ **System Information**.

Double click **Components** to expand the **Components** category.

Device Specifications

1. Click **Start** or → **All Programs**→ **Accessories**→ **System Tools**→ **System Information**.
2. Double click **Components** to expand the **Components** category.
3. Click the device category to view a table identifying the component or device name and related setting and configuration information.

Exporting System Information as a Text File

1. Click **Start** or → **All Programs**→ **Accessories**→ **System Tools**→ **System Information**.
2. On the **File** menu, click **Export**.
3. In **File name**, type the filename.
4. Select the file type from the **Save as type** drop-down menu.
5. Click **Save**.

Programs Installed on Your Computer

Click **Start** or → **All Programs** to view available programs.

If a program is not listed under **All Programs**, use the **Search** feature to search for a specific program:

Windows Vista®

1 Click **Start** →**Search.**

2 Enter the name of the program in the Search field.

3 Press <Enter>.

Windows® XP

1 Click **Start** → **Search**→ **All Files or Folders**.

2 Enter the name of the program and click **Search**.

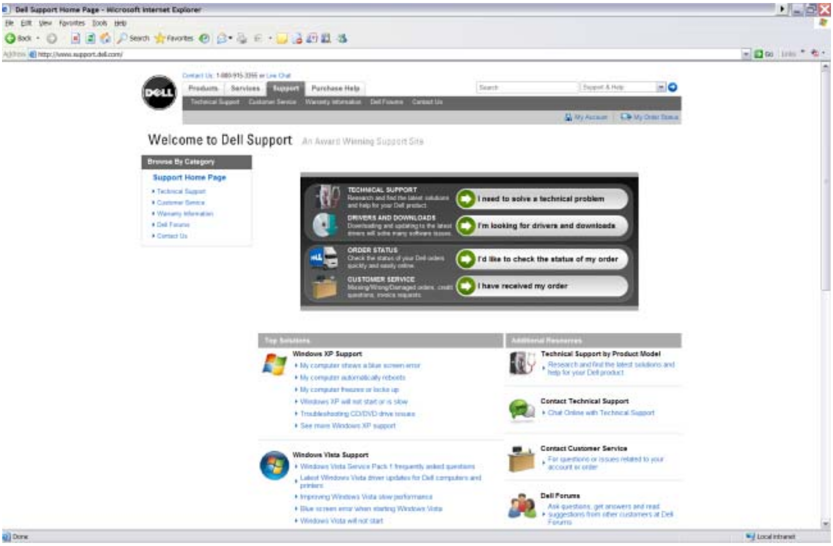
Wireless Networking

Wireless network information is available in the following sources:

Device guides	See **Microsoft Windows Help and Support** to access device guide for the specific wireless card installed in your computer. The device guide provides helpful information about connecting to a wireless network, as well as managing a wireless network connection.
Windows Help and Support	See **Microsoft Windows Help and Support** for general information about wireless networking. The “Networking and the Web” topic provides an overview, requirements, details on connections, and tutorials in basic networking.

FOR MORE INFORMATION: To learn more about wireless networking, see "Networks (LAN, Wireless, Mobile Broadband)" on page 149.

Dell Support Website



The Dell Support website at **support.dell.com** provides a variety of information:

- **Technical Support:** Research and find the latest solutions and help for your Dell product.
- **Customer Service:** Explore options such as order status and pickup for Dell products.
- **Warranty Information:** Information relating to warranty for Dell products.
- **Dell Forums:** Information on forums for discussion and support of Dell products.
- **Contact Us**: Information on various options available for contacting Dell.

Technical Support

- Drivers and Downloads
- Enterprise Resource Center
- Find Express Service Code
- Manuals

- My Systems List
- Security Center
- Support History & Status
- System Configuration
- Technical Subscriptions
- Troubleshooting Search
- Windows Vista Center
- Windows XP Support Center
- Wireless Center

Customer Service

- Dell Financial Services
- FAQs
- Invoices
- Missing, Wrong & Damaged
- Order Status
- Ownership Transfer
- International Ownership Transfer
- Packing Slips
- Pickup/Redelivery
- Dell Dollars/Rebate Center
- Report a Stolen System
- Returns
- Update Billing Address

Warranty Information

- Expired Warranty Service
- Extend & Upgrade Warranty
- Ownership Transfer
- International Ownership Transfer

- Service Contracts & Forms
- Warranty Status

Dell Forums

- Support Forums
- Discussion Forums

Contact Us

- Customer Service
- Financing Support
- Sales Support
- Technical Support
- International Notebook Support

BIOS (System Setup Program) Settings

The BIOS is a utility that serves as an interface between the computer hardware and the operating system. You may need to update your BIOS settings when you remove and replace certain hardware components.

NOTE: Although your computer's time, date, or password can be changed using the BIOS, using options provided by the operating system is recommended.

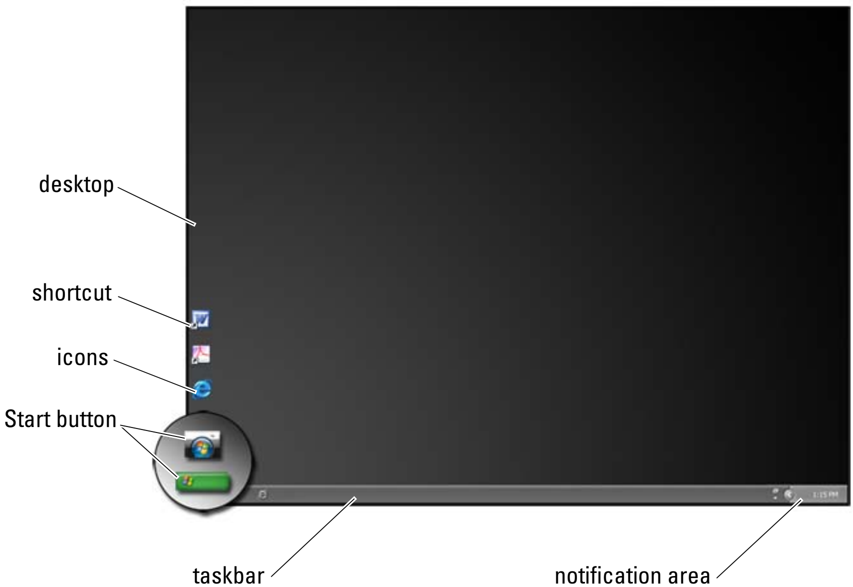
Use the system setup program to:

- Change the system configuration information after you add, change, or remove hardware in your computer.
- Set or change user-selectable options such as your password.
- Verify information about your computer's current configuration, such as the amount of system memory.

FOR MORE INFORMATION: To learn more about accessing the system setup program and configuring hardware components, see "System Setup" on page 301.

2

Microsoft Windows Desktop

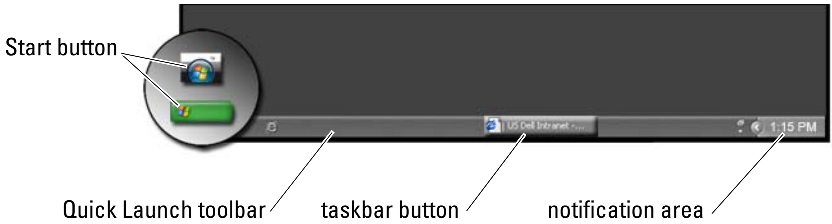


Overview

The Microsoft® Windows® desktop is the display screen area that appears after the Windows operating system starts up. The components of the desktop include a background, icons, shortcuts, and a taskbar that is usually located at the bottom of the screen.

> **FOR MORE INFORMATION:** To learn more about the Windows desktop, see "Windows Basics" in Windows Help and Support: click **Start** or → **Help and Support**.

Taskbar



Overview

The Windows taskbar is usually located at the bottom of the desktop, although you can relocate it. The taskbar provides quick access to open minimized windows on the desktop, or to frequently-used programs, files, or utilities on your computer.

The basic sections of the taskbar are:

Start button	Provides access to the Start menu, which lists the programs and system utilities installed in your computer. Use the Start menu to start software applications and to change computer settings. If you move or resize your taskbar, the Start button moves or resizes with it.
Quick Launch toolbar	Contains icons for quick access to programs.
taskbar button area	Contains buttons representing minimized windows for open application programs.
notification area	Includes a clock and icons associated with programs.

FOR MORE INFORMATION: To learn more about the Windows desktop, see "Windows Basics" in Windows Help and Support: click **Start** or → **Help and Support**.

Displaying the Taskbar

1. Right-click on an open area of the taskbar.
2. Click **Properties** to open the **Taskbar and Start Menu Properties** window.
3. On the **Taskbar** tab, select **Keep the taskbar on top of other windows**.

As you open applications and files, you may not be able to view your desktop.

To view the desktop by minimizing all open windows at once:

1. Position the cursor over an open area of the taskbar.
2. Right-click to display a shortcut menu.
3. Click **Show the Desktop**.

Customizing the Taskbar

1. Right-click on an open area of the taskbar.
2. Click **Properties**.The **Taskbar and Start menu Properties** window appears.
3. Customize the taskbar by checking the desired boxes on the **Taskbar** tab.

Displaying Hidden Icons From the Notification Area

The Notification area includes icons for quick program access. Click the arrow on the right side of the taskbar near the notification area to temporarily display the hidden icons. Click the required icon to display it again.

Adding Icons in the Notification Area

Customize the taskbar by choosing the icons it displays or hides.

1. Right-click on an open area of the taskbar.
2. Click **Properties**. The screen defaults to the **Taskbar** tab.
3. *For computers running Windows Vista®*, select the **Notification Area** tab.

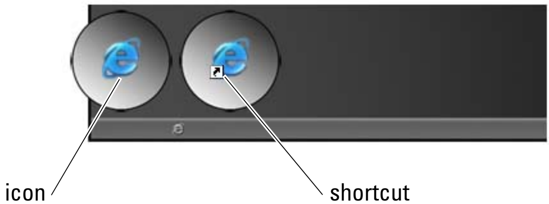
For computers running Windows® XP, continue with the next step.

4 Click the **Customize** button in the Notification area.

5 Select an item, then choose its behavior.

6 Click **OK**.

Desktop Icons and Shortcuts



Icons displayed on the Windows desktop are links that provide quick access to programs, documents, and folders. Double-click icons to open a file or folder or to run a program.

Some icons are shortcuts and other icons are direct links.

- Icons for shortcuts — Identified by an arrow in the icon, shortcuts are links to programs, files, or folders. You can safely delete a shortcut without affecting the item it links to.
- Icons for programs and files — Icons for program files, documents, or folders do not include an arrow graphic.

HINT: For better performance of your computer, create shortcuts to files and folders rather than placing them on the desktop.

Deleting an Icon From the Desktop

1 Right-click the icon, and click **Delete**.

2 Click **Yes.**

HINT: If you delete an icon with an arrow, you are simply deleting the shortcut link. If you delete an icon without an arrow, you are deleting the file or folder, not just a link to the file.

FOR MORE INFORMATION: To learn more about the Windows desktop, see “Windows Basics” in Windows Help and Support: click **Start** or → **Help and Support**.

Creating and Deleting Program Shortcuts on the Desktop

You can create a shortcut to a program, file, or folder by using: Windows Explorer or Desktop.

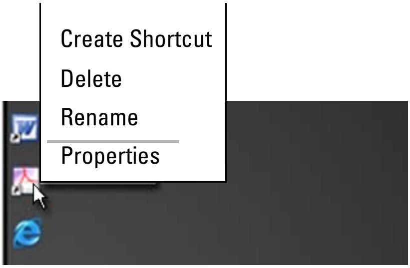
Using Windows Explorer:

1. Right-click the **Start** button, select **Explore**. Navigate to the folder or file to which you want to create a shortcut.
2. Right-click on the item, highlight **Send to,** and then click **Desktop (create shortcut)**.

Using the desktop:

1. Right-click an open area of the desktop, highlight **New,** then click **Shortcut**.
2. In the **Create Shortcut** window, click **Browse** and navigate to the location of the item you want the shortcut to link to.
3. Highlight the file or folder, and click **OK**.
4. Click **Next**.
5. Name the shortcut, and then click **Finish**.

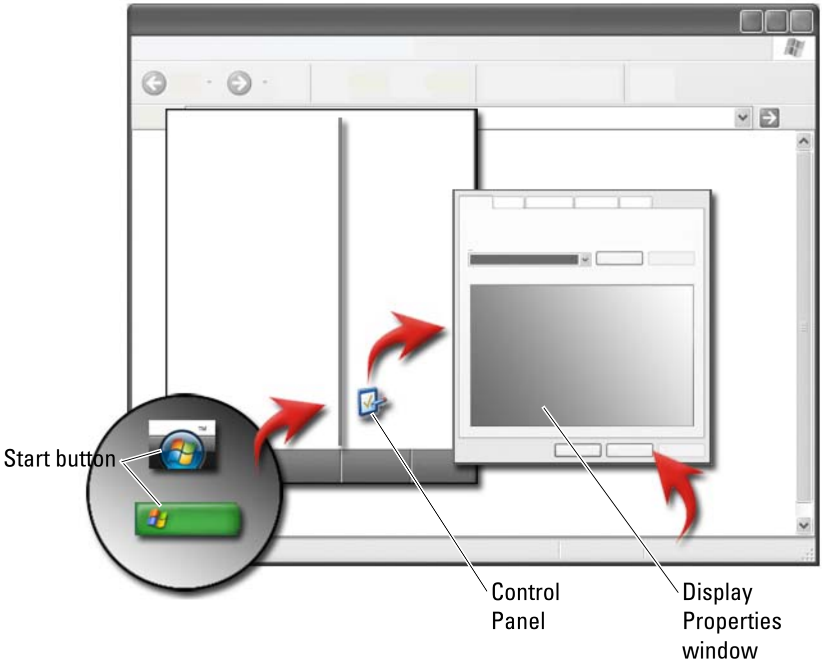
Shortcut Menus



Shortcut menus are available for many components of the Windows desktop, including files and folders. These menus provide quick access to the most common commands for an item.

To access the shortcut menus, position the cursor over the item and right-click (click the right mouse button or the right touch-pad button).

Changing the Desktop Appearance



You can personalize the appearance of your desktop by changing various components. Most of these components are accessible through the **Display Properties** window.

You can manage your computer's desktop theme, resolution, screen saver, icon size and appearance, and monitor settings from the **Display Properties Menu** screen. Use the tabs to select the items you want to adjust.

Windows Vista®

From the desktop:

1 Right-click an open area of the desktop.

2 Click **Personalize**, and the **Personalize appearance and sounds** window appears.

3 Review the available options and follow the instructions provided.

From the Start menu:

1 Click **Start** → **Control Panel**→ **Appearance and Personalization.**
2 Click **Personalization**. The **Personalize appearance and sounds** window appears.
3 Review the available options and follow the instructions provided.

Windows® XP

From the desktop:

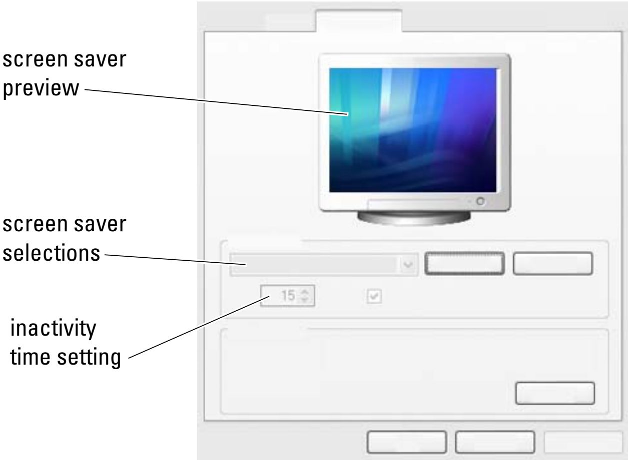
1 Right-click an open area of the desktop.
2 Click **Properties**.
3 Click **Display**. The **Display Properties** window appears.
4 Review the available options and follow the instructions provided.

From the Start menu:

1 Click **Start** → **Control Panel**→ **Appearance and Themes**.
2 The **Appearance and Themes** window appears.
3 Review the available options and follow the instructions provided.

FOR MORE INFORMATION: To learn more about the Windows desktop, see "Windows Basics" in Windows Help and Support: click **Start** or → **Help and Support**.

Setting up a Screen Saver



A screen saver is an animated graphic that appears after your computer is left inactive for a specified time. You can set the length of inactive time and select a personal graphic.

Windows Vista

1. Right-click an open area of the desktop.
2. Click **Personalize**. The **Personalize appearance and sounds** window appears.
3. Click **Screen Saver** to select a new screen saver.
4. Adjust the length of time for your computer to remain inactive before the screen saver appears.
5. Click **OK**.

NOTE: After the screen saver activates, you may need to log-in again to access your computer.

Windows XP

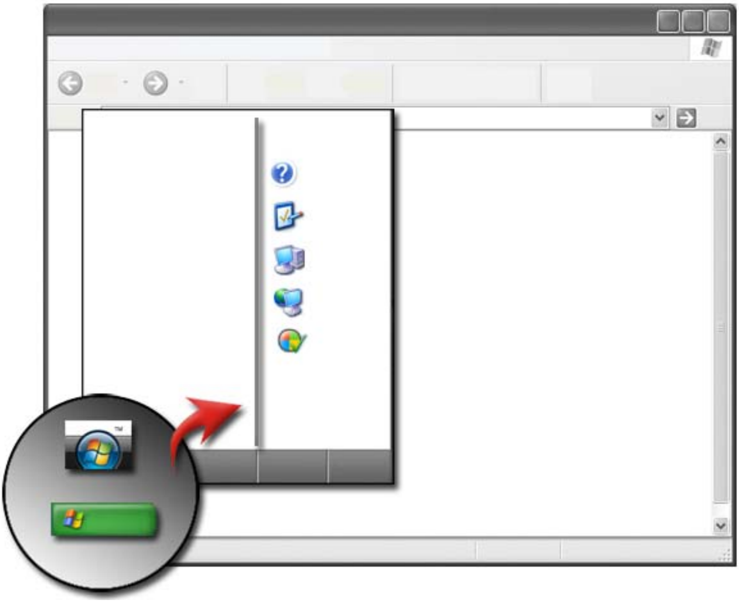
1. Right-click an open area of the desktop.
2. Click **Properties**. The **Display Properties** window appears.
3. Click the **Screen Saver** tab, and select a new screen saver.

4 Select the length of time for your computer to remain inactive before the screen saver appears.

5 Click **OK**.

NOTE: After the screen saver activates, you may need to log-in to access your computer.

Start Button (Menu)



Overview

The **Start** button opens the **Start** menu, which provides access to:

- Control Panel
- Programs
- Files
- Computer settings
- Tools that monitor your computer's performance
- Windows Help and Support

The programs available on the **Start** menu depend on the software installed in your computer.

You can use the **Start** menu to restart or shut down your computer. See "Shutting Down Your Computer" on page 99.

> **FOR MORE INFORMATION:** To learn more about the **Start** button, see "Start Button" on page 23.

Customizing the Start Menu

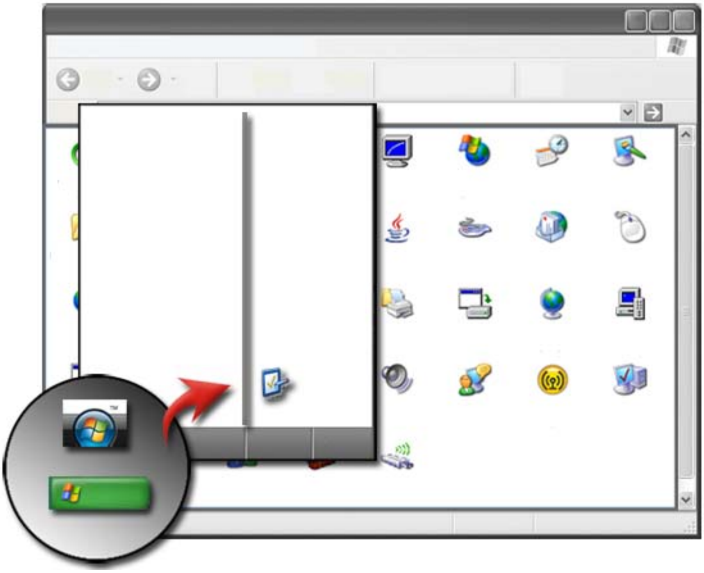
Customize the **Start** menu through the **Taskbar and Start Menu Properties** window.

1. Right-click an open area of the taskbar.
2. Select **Properties**. The **Taskbar and Start menu Properties** window appears.
3. Customize the **Start** menu by selecting the desired option on the **Start** menu tab.

> **HINT:** You can add shortcuts to the **Start** menu by dragging an icon from a program, folder, or file onto the **Start** button.

> **FOR MORE INFORMATION:** To learn more about the Windows desktop, see “Windows Basics” in Windows Help and Support: click **Start** or → **Help and Support**.

Control Panel



The **Control Panel** contains programs and tools to help you maintain and customize your computer. Through the **Control Panel**, you can:

- Add and monitor hardware
- Add or remove programs
- Change hardware settings
- Set network and Internet preferences
- Customize the appearance of your desktop
- Set up printers and other devices
- Perform maintenance to enhance performance

HINT: A list of the items you can customize appears in the Control Panel screen. Hold your cursor over each item to display the pop-up text box that explains its function.

Accessing and Using the Control Panel

> **FOR MORE INFORMATION:** To learn more about the Windows desktop, see "Windows Basics" in Windows Help and Support: click **Start** or → **Help and Support**.

Customizing Your Computer Settings

1 Click **Start** or → **Control Panel**.

2 Select a category. If you are not sure which category contains the necessary tool, hold your cursor over the category to display its pop-up text box.

Managing Your Computer Performance

The **Control Panel** provides tools for you to manage and improve your computer's performance. Use options provided to free up the space on your hard drive or rearrange items on your hard drive to make programs run faster, and so on to enhance the performance of your computer.

See "Maintenance Tasks (Enhance Performance and Ensure Security)" on page 125 for related information.

Windows Vista

1 Click **Start** → **Control Panel**→ **System and Maintenance**→ **Performance Information and Tools**.

2 Select one of the available options in the **Task** area to monitor your computer's performance and make changes to enhance performance.

Windows XP

1 Click **Start** →**Control Panel**→ **Performance and Maintenance**.

2 Select one of the options to evaluate system performance, view events, monitor the performance log, or perform computer management.

Use the Device Manager to manage devices that are installed in or attached to your computer.

HINT: Typically, to access the Device Manager:

Windows Vista

Click **Start**→ **Control Panel**→ **System and Maintenance**→ **Administrative Tools**→ **Computer Management.**

Windows XP

Click **Start**→ **Control Panel**→ **Performance and Maintenance**→ **Administrative Tools**→ **Computer Management.**

OR

Right-click **My Computer** and select **Properties**. Then click **Device Manager**.

3

Monitors and Displays

FOR MORE INFORMATION: To learn more about your computer's display screen, see the documentation for your computer. Also see the safety information that shipped with your computer for safety procedures to follow when working with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at **www.dell.com/regulatory_compliance**.

Cleaning Your Computer's Display Screen

To clean the display for a desktop computer, wipe the screen with a soft cloth dampened with water.

To clean the display screen for a laptop computer, wipe the screen with a soft cloth dampened with either water or an LCD cleaner.

CAUTION: Do not wipe the computer's display screen with any soap or solution not designed for monitors. These solutions can damage the monitor's anti-glare coating. Do not spray cleaners directly onto the screen.

Adjusting the Resolution of Your Display

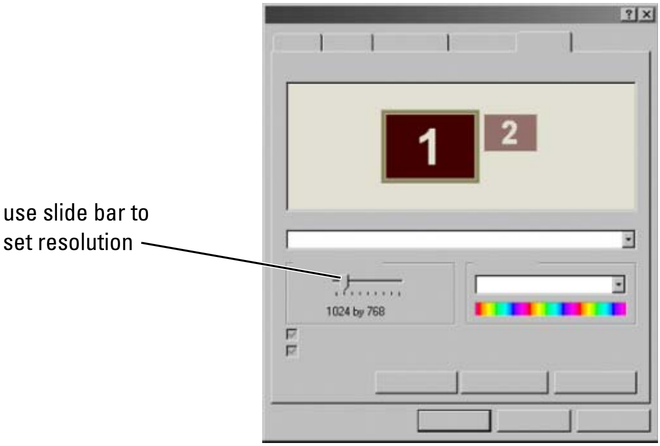


The display resolution defines the clarity of images on your display. As you increase the resolution, items appear smaller on the screen. As you decrease resolution, text and images appear larger.

Before you change any of the display settings, make a note of the current settings so you can change back to them if needed.

NOTE: Use only the Dell recommended video drivers, which are designed to offer the best performance with your Dell-installed operating system.

FOR MORE INFORMATION: To learn more about display resolution, see "Adjusting Display Settings With the Vendor Video Card Control Panel" **on page 246**. Also, see Windows Help and Support: click **Start** **or** → **Help and Support**.



> **HINT:** To display a program at a specific resolution, both the video card and the display must support the resolution, and the necessary video drivers must be installed.

Windows Vista®

1 Right-click an open area of the desktop.
2 Click **Personalize**. The **Personalize appearance and sounds** window appears.
3 Click **Display Settings**.
4 In the **Display Settings** window under **Resolution**, move the slide bar to the left or right to decrease/increase the screen resolution.
5 Click **Apply** to check if the selected resolution is ok, if not repeat step 4.
6 Click **OK**.

Windows® XP

1 Right-click an open area of the desktop.
2 Click **Properties**. The **Display Properties** window appears.
3 Select the **Setting** tab.

4 Under the **Screen resolution** section, move the slide bar to the left or right to decrease/increase the screen resolution.
5 Click **Apply** to check if the selected resolution is ok, if not repeat step 4.
6 Click **OK**.

Troubleshooting

Blurry text: If you change the display resolution from the current settings to one not supported by your computer and display, the image may appear blurry or text may be hard to read.

Unsupported resolution or color settings: If you choose a resolution or color palette that is higher than the display supported by your computer, the settings adjust automatically to the closest supported values.

Choosing the Best Display Settings

Default display settings are set for your computer based on the monitor or display screen. Access the **Display Properties** window from the **Control Panel** to determine the resolution of your monitor and make any changes.

Setting the Display Resolution for External LCD Monitors

Set external LCD monitors to their native resolution, the resolution at which the display performs the best. See the manufacturer's documentation for this information.

If you cannot determine the native resolution, set the monitor to perform at the highest resolution. Although your monitor can probably support lower resolutions, the display quality will be not be as good.

Windows Vista®

1 Right-click an open area of the desktop.
2 Click **Personalize**. The **Personalize appearance and sounds** window appears.
3 Click **Display Settings**.
4 Select the external LCD monitor in the drop-down menu.

5 In the **Display Settings** window, move the **Resolution slider bar** to the left or right to select a screen resolution that matches the native resolution of the external LCD monitor.

6 Click **OK**.

Windows® XP

1 Right-click an open area of the desktop.

2 Click **Properties**. The **Display Properties** window appears.

3 Select the **Settings** tab.

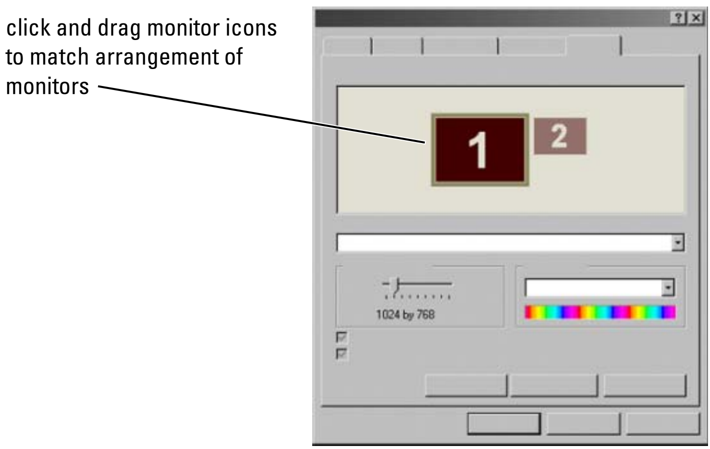
4 Select the external LCD monitor in the Display drop-down menu.

5 Under the **Screen resolution** section, move the slide bar to the left or right to select a screen resolution that matches the native resolution of the external LCD monitor.

6 Click **OK**.

Setting the Display for Multiple Monitors

Multiple monitors can be setup with your computer to improve productivity by expanding the size of your desktop. You can then work on more than one task at a time by moving items from one monitor to another or by stretching them across monitors.



NOTE: Your video card must support multiple monitors. See Windows Help and Support for information on the requirements for setting up multiple monitors.

Windows Vista

1. Right-click an open area of the desktop.
2. Click **Personalize**, and the **Personalize appearance and sounds** window appears.
3. Click **Display Settings**.
4. Drag the monitor icons to match the physical arrangement of your monitors.
5. Select either or both of the following check boxes depending on your need:
   - **This is my main Monitor** — allows you to set the main monitor.
   - **Extend the desktop onto this monitor** — allows you to drag items across your screen onto alternate monitors.
6. Click **OK.**

Windows XP

1. Right-click an open area of the desktop.
2. Click **Properties**, and the **Display Properties** window appears.
3. Select the **Settings** tab.
4. Drag the monitor icons to match the physical arrangement of your monitors.
5. Select either or both of the following check boxes depending on your need:
   - **Use this device as a primary monitor** — allows you to set the primary monitor.
   - **Extend my Windows desktop onto this monitor** — allows you to drag items across your screen onto alternate monitors.
6. Click **OK**.

FOR MORE INFORMATION: To learn more about accessing the **Display Properties** window to configure multiple monitors, see "Control Panel" on page 44. For more detailed information about the Control Panel, see “Windows Basic” in Windows Help and Support: click **Start** or → **Help and Support**.

Using the Ambient Light Sensor in Bright or Low-Light Environments:

NOTE: Your laptop computer may not have an ambient light sensor.

NOTE: The ambient light sensor adjusts the display brightness on your laptop computer only. It does not control the brightness on external monitors or projectors.

The ambient light sensor is located on the front of the computer display. The sensor detects available environmental light and automatically increases or decreases the display backlighting to compensate for low-light and high-light environments.



1 Ambient Light Sensor

You can enable or disable the ambient light sensor feature by pressing the <Fn> and left-arrow key combination.

NOTE: Do not cover the ambient light sensor with any adhesive labels. If covered, the sensor—when enabled—automatically sets the display brightness to the minimum level.

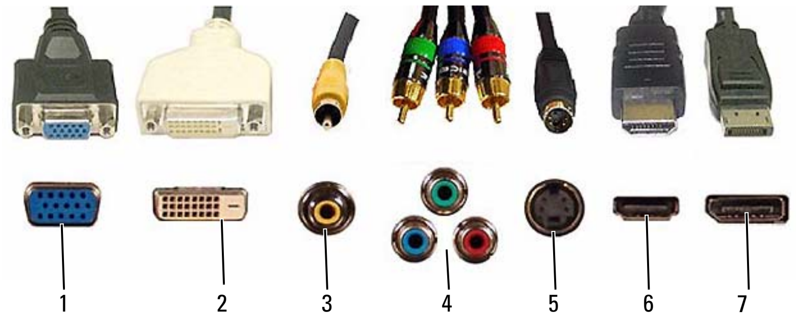
NOTE: The ambient light sensor is disabled when your computer is connected to an electrical outlet.

Using the display brightness key combinations disables the ambient light sensor and the display brightness increases or decreases accordingly.

NOTE: Rebooting the computer returns the ambient light sensor to it's prior setting (either enabled or disabled).

Cables and Connections

Every monitor has at least two cable requirements, power and data. Your Dell monitor may support one or more of the following data connectors:



	Connector	Signal Type	Audio Support	Connects to
1	VGA	Analog	No	Monitor or Projector
2	DVI	Digital	No	Monitor or Projector
3	Composite	Analog	No	Home entertainment system
4	Component	Analog	No	Home entertainment system
5	S-Video	Analog	No	• Home entertainment system • Monitor • Projector
6	HDMI	Digital	Yes	• Home entertainment system • Monitor • Projector
7	DisplayPort	Digital	Yes	• Home entertainment system • Monitor • Projector

For pin assignments of the above ports, see "Ports" on page 313.

DisplayPort™ - Features and Benefits

Dell, in collaboration with a group of leading PC, graphics, and semiconductor companies, has developed an open-standards based, royalty-free, and extensible interface, **DisplayPort**, suited for both external desktop monitors and internal display interfaces.

By consolidating the internal and external signaling methods, DisplayPort enables the introduction of "direct drive" digital monitors, resulting in the most efficient means possible for delivering flat panel display technology to end users.

DisplayPort is also suitable for connectivity between high definition content applications such as optical disc players, mobile devices, personal video recorders, and TVs.

Other features include:

- Higher resolutions such as WQXGA (2048x1536 pixels).
- Variable color depth (up to 30 bits-per-pixel (bpp)).
- Up to 120Hz refresh rate.
- HDCP v1.3 support for viewing Blu-ray disc content.
- Support for cables up to 15m long.
- A single interface and cable that accommodates two-way audio and video for systems with built-in or external speakers, microphone, and camera.
- Better performance than dual link DVI (10.6 Gbps vs. 9.6 Gbps)
- High-bandwidth audio.

For more information, see **www.displayport.org**.

NVIDIA SLI and ATI Crossfire Technologies

In some graphics configurations, two or more identical graphics cards can be configured to enable NVIDIA SLI (Scalable Link Interface) or ATI Crossfire technologies. Doing so can increase gaming and 3D application performance.

Detailed information about the benefits of using these technologies can be found on the NVIDIA and ATI websites respectively.

4

Navigation Devices (Mouse, Keyboard, Touch Pad)

You can use a mouse, a keyboard, a touch pad, and a pointing stick (track stick) to navigate and make selections from the features available on your Microsoft® Windows® desktop.



FOR MORE INFORMATION: To learn more about these devices, see the documentation for your computer. Also, see Windows Help and Support: click **Start** → **Help and Support**.

Mouse



A mouse typically consists of two buttons and a scroll wheel.

- Use the left and right buttons to select or click items on the screen.
- Use the scroll wheel to scroll through pages or windows on the screen. To scroll down, roll the wheel backward (toward you). To scroll up, roll the wheel forward (away from you).

Controlling the Speed of the Mouse Buttons

Windows Vista®

1. Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Mouse**.
2. On the **Button** tab in the **Mouse Properties** window, use the slide bar to select the speed that feels right for you.
3. Click **OK**.

Windows® XP

1. Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Mouse**.
2. On the **Buttons** tab of the **Mouse Properties** window, use the slide bar to select the speed that feels right for you.
3. Click **OK**.

Controlling the Speed of the Scroll Wheel

Windows Vista®

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Mouse**.

2 On the **Wheel** tab in the **Mouse Properties** window, set the options for how the scroll wheel on your mouse operates.

3 Click **OK**.

Windows® XP

1 Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Mouse**.

2 On the **Wheel** tab, under **Scrolling**, select the number of lines to scroll with each notch on the wheel, or click **One screen at a time**.

3 Click **OK**.

Cleaning a Non-Optical Mouse

If your screen cursor (mouse pointer) skips or moves abnormally, clean the mouse.

NOTICE: Disconnect the mouse from the computer before cleaning the mouse.



1 Clean the outside casing of the mouse with a cloth moistened with a mild cleaning solution.

2 Turn the retainer ring on the underside of your mouse counterclockwise, and then remove the ball.

3 Wipe the ball with a clean, lint-free cloth.

4 Blow carefully into the ball cage, or use a can of compressed air, to dislodge dust and lint.

5 If the rollers inside the ball cage are dirty, clean the rollers with a cotton swab moistened lightly with isopropyl alcohol.

6 Recenter the rollers in their channels if they are misaligned. Ensure that fluff from the swab is not left on the rollers.

7 Replace the ball and retainer ring, and turn the retainer ring clockwise until it clicks into place.

Cleaning an Optical Mouse

Clean the outside casing of the mouse with a cloth moistened with a mild cleaning solution.

Using a Bluetooth® -Enabled Wireless Mouse

Before you set up a Bluetooth-enabled device, you need to:

1 Add a Bluetooth adapter to your computer, if one is not already built in to your computer.

2 Set up the device so that your computer can find (or discover) it. Check the manufacturer's guide or website for instructions.

3 Install the device, using the instructions in the following section that corresponds to the operating system installed in your computer.

Windows Vista

1 Click **Start** → **Control Panel**.

2 Click **Hardware and Sound**→ **Bluetooth Devices**.

3 Click the device that you want to change, and then click **Properties**.

4 Do any of the following:

- To change the name of the device, type a new name, click the **General** tab, and click **OK**.
- To enable a service, select the check box next to the service on the **Services** tab, and click **OK**.
- To disable a service, clear the check box next to the service on the **Services** tab, and click **OK**.

- To make your computer discoverable to Bluetooth-enabled devices, in the **Bluetooth Devices** dialog box on the **Options** tab, select the **Allow Bluetooth devices to find this computer** check box.
- To be notified when a Bluetooth-enabled device wants to connect to your computer, in the **Bluetooth Devices** dialog box on the **Options** tab, select the **Alert me when a new Bluetooth device wants to connect** check box.

Windows® XP

1. Attach or turn on your Bluetooth-enabled adapter.
2. Make your mouse discoverable by pressing a button on the bottom of the mouse. See your mouse documentation for more information.
3. Click **Start**→ **Control Panel**→ **Bluetooth Devices**.
4. On the **Devices** tab, click **Add**.
5. Select the **My device is set up and ready to be found** check box, and click **Next**.
6. Click the icon that represents the Bluetooth-enabled mouse, and click **Next**.
7. Click **Don't use a passkey**→ **Next**. Check the documentation for the mouse for any passkey instructions.
8. Follow the remaining instructions in the wizard.

FOR MORE INFORMATION: To learn more about adding and configuring devices, see Windows Help and Support: click **Start** or → **Help and Support**.

Touch Pad



You can use your finger for touch input (or a Tablet PC pen on some computers) to move the cursor or select objects on the screen:

- To move the cursor, lightly slide your finger or pen over the touch pad.
- To select an object, lightly tap once on the surface of the touch pad or use your thumb to press the left touch-pad button.
- To select and move (or drag) an object, position the cursor on the object and tap twice on the touch pad. On the second tap, leave your finger or pen on the touch pad and move the selected object by sliding your finger or pen over the surface.
- To double-click an object, position the cursor on the object and tap twice on the touch pad or use your thumb to press the left touch pad button twice.

Circular Scrolling

NOTE: Your laptop computer may not support the circular scrolling feature.

To configure the circular scrolling, double-click the Dell Touch pad icon in the notification area of your desktop.

In the Scrolling tab, enable or disable scrolling or circular scrolling, choose the scroll zone width and scroll speed.

When circular scrolling is enabled, you can scroll up or down by moving your finger anti-clockwise or clockwise on the touch pad.

Single Finger Zoom

NOTE: Your laptop computer may not support single finger zoom feature.

To change the zoom settings, double-click the Dell Touch Pad icon in the notification area of your desktop.

In the **Gestures** tab, enable or disable the one-finger zoom (zoom in and out moving the finger upward or downward) or the pinch zoom (zoom in and out by spreading two fingers or by bringing the two fingers together).

Cleaning the Touch Pad

1. Shut down and turn off your computer.
2. Disconnect any attached devices from the computer and from their electrical outlets.
3. Remove any installed batteries.
4. Moisten a soft, lint-free cloth with water, and wipe it gently across the surface of the touch pad. Do not allow water from the cloth to seep between the touch pad and the surrounding palm rest.

Using a Touch Pointer (Track Stick or Tablet PC Pen)

Turning the Touch Pointer On or Off From the Control Panel

Windows Vista®

1. Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Pen and Input Devices**.
2. On the **Touch Pointer** tab, select or clear the **Show the touch pointer when I'm interacting with items on the screen** check box.
3. Click **OK**.

Windows® XP

1. Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Pen and Input Devices**.

2 On the **Touch Pointer** tab, select or clear the **Show the touch pointer when I'm interacting with items on the screen** check box.

3 Click **OK**.

Turning the Touch Pointer On or Off From the Taskbar

1 Use your finger to press and hold the taskbar.

2 Point to **Toolbars**, and then tap **Touch Pointer**.

3 To turn the touch pointer on or off, tap the **Touch Pointer** icon on the taskbar.

Using a USB Pointing Device (Mouse)

Your computer usually auto-detects and installs the drivers for your mouse when the mouse is connected to the USB port.

NOTE: Certain mice may not be auto-detected by your computer. You then need to install the appropriate drivers manually.

FOR MORE INFORMATION: To learn more about using a USB pointing device, see the pointing device's manufacturer's guide for more information. Also, see Windows Help and Support: click **Start** or → **Help and Support**.

Troubleshooting a USB Pointing Device

You may need to reactivate a USB pointing device if any of the following problems occur:

- The pointer moves erratically.
- The pointer does not respond when you move the pointing device.
- Nothing happens when you click a button on the pointing device.
- The pointing device stops working after a few minutes of use.

System Restore can be performed if you fail to reactivate the USB pointing device.

For more information on System Restore see "Using Microsoft® Windows® System Restore" on page 265

> **HINT:** If you still have problems with the pointing device, check the software driver for the device. You may have to reinstall the driver. See "Determining Whether a Device Driver is the Source of a Device Problem" **on page 79**.

Keyboard



Your keyboard provides different sets of keys to perform different sets of functions:

- Alphanumeric keys for typing letters, numbers, punctuation, and symbols
- Control keys for performing certain actions: <Ctrl>, <Alt>, <Esc>, and the Windows logo key
- Function keys, labeled <F1>,< F2>, <F3>, and so on, for performing specific tasks
- Navigation keys for moving the cursor around in documents or windows: <Home>, <End>, <Page Up>, <Page Down>, <Delete>, <Insert >, and arrow keys
- Numeric keypad of numbers grouped together like those on an adding machine (The numeric keypad on most laptop computers is integrated into the alphabetic keys.)

Customizing Your Keyboard

You can adjust your keyboard settings to:

- Change the delay before keyboard characters repeat.
- Change the speed at which keyboard characters repeat.
- Change the cursor blink rate.
- Customize key sequences for input languages.

Windows Vista

1. Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Keyboard**.
2. Adjust the keyboard settings you want to change and click **OK**.

Windows XP

1. Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Keyboard**.
2. On the **Keyboard Properties** window, adjust the keyboard settings you want to change and click **OK**.

Backlit Keyboard

NOTE: Your computer may not support a backlit keyboard feature.



The backlit keyboard provides visibility in dark environments by illuminating all symbols on the keys.

Keyboard/ Touch Pad brightness settings — Press <Fn> and the right-arrow key to toggle between the three lighting states (in the given order).

The three lighting states are:

1 full keyboard/touch pad brightness.

2 half keyboard/touch pad brightness.

3 no lighting.

Changing the Input Language of Your Keyboard

Windows Vista

1 Click **Start** → **Control Panel**→ **Clock, Language, and Region**→ **Regional and Language Options**.

2 Click **Change keyboards or other input methods.**

3 On the **Keyboards and Languages** tab, click **Change keyboards**.

4 Under **Installed services**, click **Add**.

5 Click the language you want to add, select the text services you want to add, and then click **OK**.

NOTE: If the Language bar is not visible, right-click the taskbar, point to **Toolbars**, and then click **Language bar**.

6 Click the **Input language** button on the language bar.

7 Select the input language you want to use.

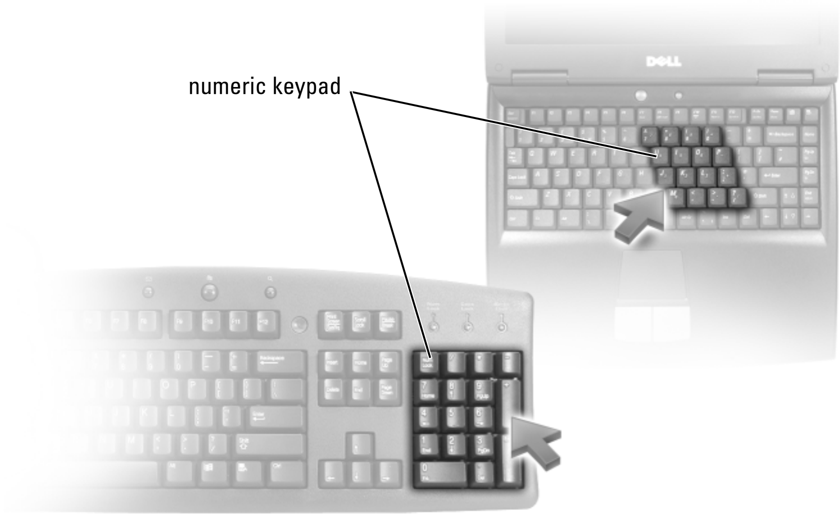
8 Click the **Keyboard layout** button, and then select a keyboard layout.

Windows XP

1 Click **Start** → **Control Panel**→ **Date, Time, Language, and Regional Options**→ **Regional and Language Options**.

2 On the **Regional Options** tab of the **Regional and Language Options** window, select a language and click **OK**.

Using the Numeric Keypad on a Laptop Computer



Your laptop computer may have a numeric keypad integrated into the keyboard. The keypad corresponds to the keypad of an extended keyboard.

- To type a number or symbol, press and hold <Fn> and press the desired key.
- To enable the numeric keypad, press <Num Lk>. The light indicates that the keypad is active.
- To disable the numeric keypad, press <Num Lk> again.

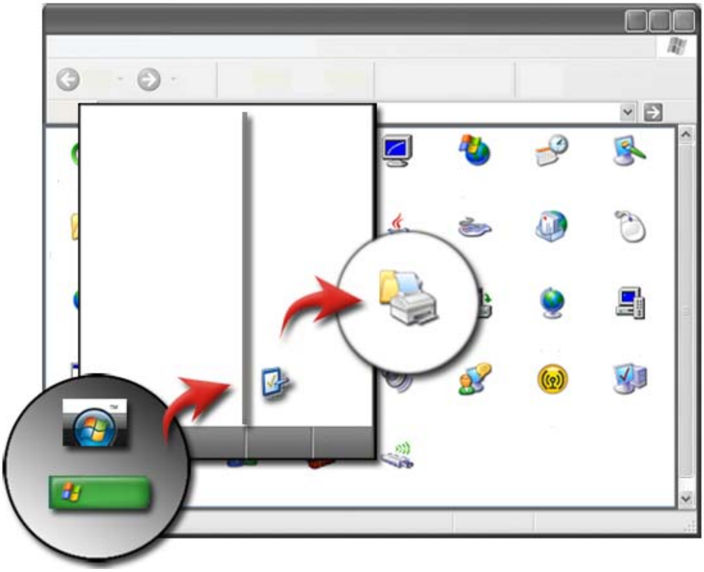
General Keyboard Shortcuts

<Ctrl><Shift><Esc>	Opens the **Task Manager** window.
<Fn><F8>	Displays icons representing all currently available display options (display only, external monitor or projector only, both display and projector, and so on). Highlight the desired icon to switch the display to that option.
<Fn> and up-arrow key	Increases brightness on an integrated display.
<Fn> and down-arrow key	Decreases brightness on the integrated display only (not on an external monitor).
<Fn><Esc>	Activates a power management mode. You can reprogram this keyboard shortcut to activate a different power management mode using the **Advanced** tab in the **Power Options Properties** window.
<F2>	Renames the selected item.
<F3>	Searches for a file or folder.
<F4>	Displays the Address bar list in Windows Explorer.
<F5>	Refreshes the active window.
<F6>	Cycles through screen elements in a window or on the desktop.
<F10>	Activates the menu bar in the active program.
<Ctrl><c>	Copies a selected item.
<Ctrl><x>	Cuts a selected item.
<Ctrl><v>	Pastes a selected item.
<Ctrl><z>	Undoes an action.
<Ctrl><a>	Selects all items in a document or window.
<Ctrl><F4>	Closes the active window (in programs that allow you to have multiple documents open simultaneously).
<Ctrl><Alt><Tab>	Uses the arrow keys to switch between open items.

<Alt><Tab>	Switches between open items.
<Alt><Esc>	Cycles through items in the order in which they were opened.
<Delete>	Deletes a selected item and move it to the Recycle Bin.
<Shift><Delete>	Deletes the selected item without moving it to the Recycle Bin first.
<Ctrl> and right-arrow key	Moves the cursor to the beginning of the next word.
<Ctrl> and left-arrow key	Moves the cursor to the beginning of the previous word.
<Ctrl> and down-arrow key	Moves the cursor to the beginning of the next paragraph.
<Ctrl> and up-arrow key	Moves the cursor to the beginning of the previous paragraph.
<Ctrl><Shift> with an arrow key	Selects a block of text.
<Shift> with any arrow key	Selects more than one item in a window or on the desktop, or select text within a document.
Windows logo key and <m>	Minimizes all open windows.
Windows logo key and <Shift><m>	Restores all minimized windows. This key combination functions as a toggle to restore minimized windows following the use of the Windows logo key and <m> combination.
Windows logo key and <e>	Starts Windows Explorer.
Windows logo key and <r>	Opens the **Run** dialog box.
Windows logo key and <f>	Opens the **Search Results** dialog box.
Windows logo key and <Ctrl><f>	Opens the **Search Results-Computer** dialog box (if the computer is connected to a network).
Windows logo key and <Pause>	Opens the **System Properties** dialog box.

5

Printers—Settings and Drivers



Accessing Printer Information

You can find information about your printer(s) through the **Start** button. From the **Start** menu, click **Control Panel** to access the hardware on your computer, including a list of printers connected to your computer.

See your printer manufacturer's documentation for hardware-specific information.

HINT: Add a shortcut to your printer on your Start menu. For more information, see "Desktop Icons and Shortcuts" **on page 36**. Also, see Microsoft® Windows® Help and Support: click Start or → Help and Support.

Changing Printer Settings

Your printer settings determine print quality, finishing options (such as double-sided print) and ink or toner usage, supported paper size, and so on.

For Windows Vista®

1 Click **Start** →**Control Panel**→ **Hardware and Sound**→ **Printers and Faxes**.

For Windows® XP

Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Printers and Faxes**.

2 Navigate through the list of available printers, and right-click the desired printer to change the settings.

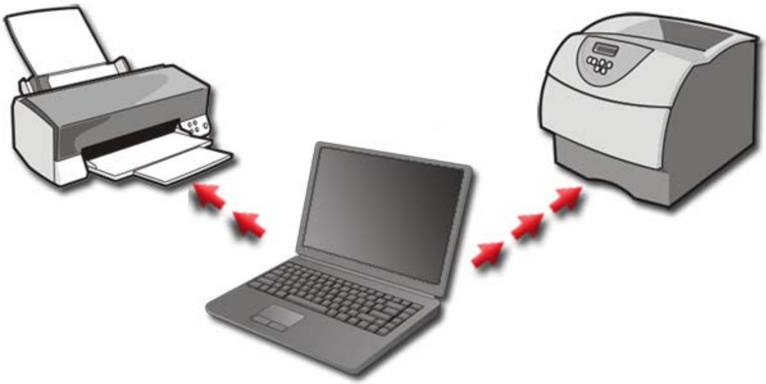
3 Select either **Properties** or **Printing Preferences**. The model of printer you have will determine the type of selections you can make.

- **Printing Preferences**: Use the tabs in this window to select image quality, manage color, or set up effects.
- **Properties**: Use the tabs in this window to view your current settings and make changes to the device itself.

EXAMPLE: If you want to print pictures from a digital camera onto photo paper, use the Quality Type tab to select your photo paper type.

Setting up Printers

You can connect one or more printers to your computer and add one or more computers to your printer.



> **EXAMPLE:** You have a laptop computer that you use at work and at home. If you want to print at both locations, you can install both the printers on your computer.

Adding a Printer

Windows Vista®

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Printers**.

For Windows XP

Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Printers and Faxes**.

2 Click **Add a Printer**.

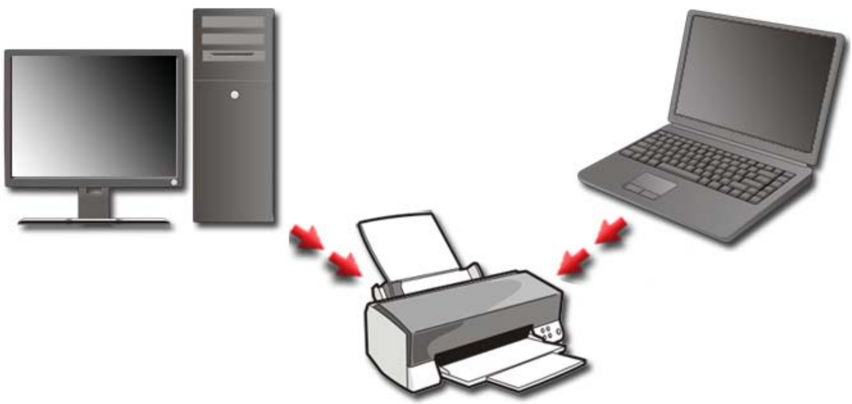
3 Follow the instructions on the **Add Printer Wizard** screen.

Setting the Default Printer

Set the printer you use most often as the default printer.To set a specific printer as your default printer, right-click on the printer icon, and select **Set as Default Printer**. A checkmark appears above the icon of the printer selected as the default.

Sharing Printers on a Network

A shared printer is one that receives input from more than one computer. A shared printer is also called a network printer. Once you are connected to a shared printer on the network, you can use it as if it were attached to your computer.

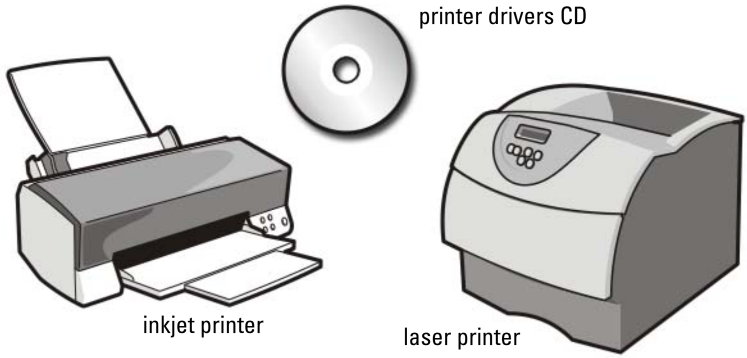


To share your printer on a network, you must first add a network service to your computer.

For instructions on installing a network service, see "Networks (LAN, Wireless, Mobile Broadband)" on page 149. Once your computer is connected to a network, you can add your printer to that connection.

FOR MORE INFORMATION: To learn more about connecting to a network, see Windows Help and Support: click **Start** or → **Help and Support**.

Installing a Printer Driver



A driver is a program that controls a device, such as a printer, and allows it to interface with your computer. All devices require a driver program.

Printer drivers are shipped on a CD along with the printer.

You may need to install or reinstall printer drivers if you:

- Upgrade your operating system
- Reinstall your operating system
- Connect or install a new printer

To install a printer driver:

1. Insert your *Drivers and Utilities* media.

   If this is your first time to use your *Drivers and Utilities* media, continue to step 2. If not, proceed to step 5.

2. When the *Drivers and Utilities* installation program starts, follow the prompts on the screen.

   NOTE: In most cases, the *Drivers and Utilities* program starts automatically. If it does not, start Windows Explorer, click your media drive directory to display the media contents, and then double-click the **autorcd.exe** file.

3. When the **InstallShield Wizard Complete** window appears, remove the *Drivers and Utilities* media and click **Finish** to restart the computer.

4. When you see the Windows desktop, reinsert the *Drivers and Utilities* media.

5 When the **Welcome Dell System Owner** screen appears, click **Next**.

A message appears, stating that the *Drivers and Utilities* program is detecting hardware in your computer.

HINT: The drivers that are used by your computer are automatically displayed in the *My Drivers—The Resource CD has identified these components in your system* window.

NOTE: The *Drivers and Utilities* menu displays drivers only for hardware that came installed in your computer. If you installed additional hardware, the drivers for the new hardware may not be displayed. If those drivers are not displayed, exit the *Drivers and Utilities* program, shut down all programs, and restart your computer. For device driver information, see the documentation that came with the device.

6 Click the driver that you want to reinstall and follow the instructions on the screen.

If a particular driver is not listed, then that driver is not required by your operating system.

6

Drives and Media



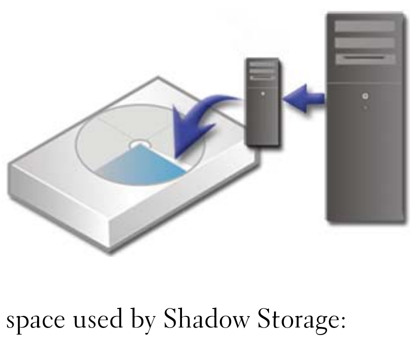
Freeing up Hard Drive Space

Microsoft® Windows Vista® reserves approximately 1 GB on a hard drive for operating system functions, leaving the remaining space for other standard operations.

To determine how much space is available for standard operations, click **Start** → **Computer**. A list of drives and storage devices appears. The free space on drive C (the hard drive) is displayed.

Shadow Storage

Shadow Storage is space reserved on the hard drive for conducting a System Restore (see "Using Microsoft® Windows® System Restore" on page 265).



To determine the amount of hard drive space used by Shadow Storage:

1 Click **Start** → **All Programs**→ **Accessories**.

2 Right-click **Command Prompt**.

3 Click **Run as administrator**.
4 If a window appears asking permission to continue, click **Continue**.
5 Type the following:

`vssadmin list shadowstorage`.

6 Press <Enter>.

The **Command Prompt** displays the amount of space used by Shadow Storage.

Reducing Hard Drive Space Used by Shadow Storage

1 Click **Start** → **All Programs**→ **Accessories**.
2 Right-click **Command Prompt**.
3 Click **Run as administrator**.
4 If a window appears asking permission to continue, click **Continue**.
5 Type the following:

vssadmin resize shadowstorage /On=C: /Maxsize=[the maximum space you will allow for Shadow Storage]

6 Press <Enter>.
7 Click **Start** → **Computer**→ **Local Disk** (C:) to confirm that less drive space has been allocated to Shadow Storage.

NOTE: See Windows Help and Support for information on optimum and minimum sizes for this storage area.

Solid-State Drive (SSD)

A solid-state drive (SSD) is a data storage device that uses solid-state memory to store persistent data. Solid-state is an electrical term that refers to electronic circuitry that is built entirely out of semiconductors whereas Hard Drives use a magnetic media.

Unlike flash-based memory cards, an SSD emulates a hard disk drive, thus easily replacing it in most applications. An SSD using SRAM (Static Random Access Memory) or DRAM (Dynamic Random Access Memory), instead of a flash memory, is often called a RAM-drive.

Installing Drivers for Media Drives

A driver is a program that controls your media drive. You may need to install drivers if you:

- Upgrade your operating system.
- Reinstall your operating system.
- Connect or install a new device.

> **HINT:** You must be logged in with administrator privileges to perform the tasks mentioned in this section.

Determining Whether a Device Driver is the Source of a Device Problem

1. Click **Start** and right-click **Computer**.
2. Click **Properties**→ **Device Manager**.
3. If a window appears asking permission to continue, click **Continue**.
4. Scroll down the list to see if any device has an exclamation point (a yellow circle with a [!]) on the device icon.

   If an exclamation point is next to the device name, you may need to reinstall or update the driver.

Replacing a Driver With a Previous Version of the Driver

If a problem occurs on your computer after you install or update a driver, use Windows Device Driver Rollback.

1. Click **Start** and right-click **Computer**.
2. Click **Properties**→ **Device Manager**.
3. Right-click the device for which the new driver was installed, and click **Properties**.
4. Click the **Drivers** tab→ **Roll Back Driver**.

If Device Driver Rollback does not resolve the problem, use System Restore (see "Using Microsoft® Windows® System Restore" on page 265) to return your computer to the state that existed before you installed the new driver.

Using the Drivers and Utilities Media to Reinstall a Driver

1. With the Windows desktop displayed, insert the *Drivers and Utilities* media.

   If this is your first time to use the *Drivers and Utilities* media, go to step 2. If not, go to step 5.

2. When the *Drivers and Utilities* media installation program starts, follow the prompts on the screen.
3. When the **InstallShield Wizard Complete** window appears, remove the *Drivers and Utilities* media and click **Finish** to restart the computer.
4. When you see the Windows desktop, reinsert the *Drivers and Utilities* media.
5. At the **Welcome Dell System Owner** screen, click **Next**.

   A message appears, stating that the *Drivers and Utilities* media is detecting hardware in your computer.

   The drivers used by your computer are automatically displayed in the **My Drivers—The Drivers and Utilities media has identified these components in your system** window.

> **HINT:** The drivers for additionally installed devices may not be included on the Drivers and Utilities media. See the documentation that came with the device for information about the driver for that device.

6. Click the driver that you want to reinstall and follow the instructions on the screen.

Manually Reinstalling a Driver

1. Download the driver for the device to your hard drive.
2. Click **Start** and right-click **Computer**.
3. Click **Properties**→ **Device Manager**.
4. Double-click the type of device for which you are installing the driver (for example, **Audio** or **Video**).

5 Double-click the name of the device for which you are installing the driver.

6 Click the **Driver** tab→ **Update Driver**→ **Browse my computer for driver software**.

7 Click **Browse**, and browse to the location to which you previously copied the driver files.

8 When the name of the appropriate driver appears, click the name of the driver→ **OK**→ **Next**.

9 Click **Finish** and restart your computer.

HINT: The Dell Support website at support.dell.com and your Drivers and Utilities media provide approved drivers for Dell computers. If you install drivers obtained from other sources, your computer might not work correctly.

Drive Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions that came with your computer.

ENSURE THAT MICROSOFT WINDOWS RECOGNIZES THE DRIVE — Click **Start**→ **My Computer**. If the drive is not listed, contact Dell (see "Contacting Dell" on page 337).

TEST THE DRIVE —

- Insert another CD, DVD, or Blu-ray Disc® (BD) to eliminate the possibility that the original media is defective.
- Insert a bootable disc and restart the computer.

CLEAN THE DRIVE OR DISK — See the user documentation that came with your computer.

FOR DRIVES WITH SPINDLES AND/OR TRAYS, ENSURE THAT THE MEDIA IS SNAPPED ONTO THE SPINDLE

FOR DRIVES THAT USE SLOT-LOADING, ENSURE THAT THE MEDIA IS COMPLETELY IN THE SLOT

CHECK THE CABLE CONNECTIONS

RUN THE HARDWARE TROUBLESHOOTER — See "Windows Hardware Troubleshooter" on page 280.

RUN THE DELL DIAGNOSTICS — See "Running the Dell Diagnostics" on page 281.

Optical Drive Problems

NOTE: High-speed optical drive vibration is normal and may cause noise, which does not indicate a defect in the drive or the media.

NOTE: Because of different regions worldwide and different disc formats, not all DVDs work in all DVD drives.

Problems writing to a media drive

CLOSE OTHER PROGRAMS

CHANGE THE WRITE SPEED TO A SLOWER RATE — See the help files for your CD, DVD, or BD software.

The drive tray cannot eject (for drives that are not slot-loading)

1 Ensure that the computer is shut down.

2 Straighten a paper clip and insert one end into the eject hole at the front of the drive, and then push firmly until the tray is partially ejected.

3 Gently pull out the tray until it stops.

The drive makes a scraping or grinding sound

- Ensure that the sound is not caused by a program.
- Ensure that the disc is inserted properly.

Hard Drive Problems

ALLOW THE COMPUTER TO COOL BEFORE TURNING IT ON — A hot hard drive may prevent the operating system from starting. Try allowing the computer to return to room temperature before turning it on.

RUN CHECK DISK —

Windows Vista®

1 Click **Start** → **Computer**.

For Windows® XP:

Click **Start** → **My Computer**.

2 Right-click **Local Disk (C:)**.

3 Click **Properties**→ **Tools**→ **Check Now**.

NOTE: The **User Account Control** window may appear. If you are an administrator on the computer, click **Continue**; otherwise, contact your administrator to continue the desired action.

4 Click to check **Scan for and attempt recovery of bad sectors**, and then click **Start**.

Working with RAID

A redundant array of independent disks (RAID) is a disk storage configuration that increases performance or data redundancy. There are four basic RAID levels discussed in this section.

NOTE: RAID requires multiple hard drives. The number of hard drives required varies depending on the RAID configuration.

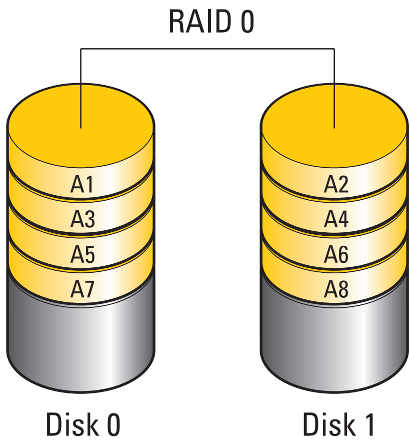
- RAID level 0 is recommended for higher performance (faster throughput).
- RAID level 1 is recommended for users who need a high level of data integrity.
- RAID level 0+1 is recommended for higher performance and data integrity
- RAID level 5 is recommended for higher performance and fault tolerance.

FOR MORE INFORMATION: Your computer may support other RAID levels (5, 10, 50). For information about these levels, see support.dell.com.

RAID Level 0

NOTICE: RAID level 0 provides no redundancy. Therefore, a failure of one drive results in the loss of all data. Perform regular backups to protect your data.

RAID level 0 uses data *striping* to provide a high data access rate. Data striping writes consecutive segments, or stripes, of data sequentially across the physical drive(s) to create a large virtual drive. This allows one of the drives to read data while the other drive is searching for and reading the next block.

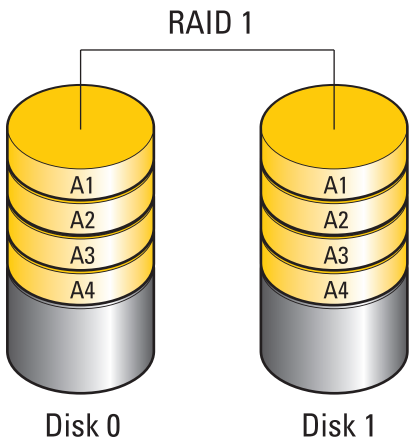


RAID 0 uses the full storage capacities of both drives. For example, two 120-GB hard drives combine to provide 240 GB of hard drive space on which to store data.

NOTE: In a RAID 0 configuration, the size of the configuration is equal to the size of the smallest drive multiplied by the number of drives in the configuration.

RAID Level 1

RAID level 1 uses data *mirroring* to enhance data integrity. When data is written to the primary drive, the data is also duplicated, or mirrored, on the second drive in the configuration. RAID 1 sacrifices high data-access rates for data redundancy.

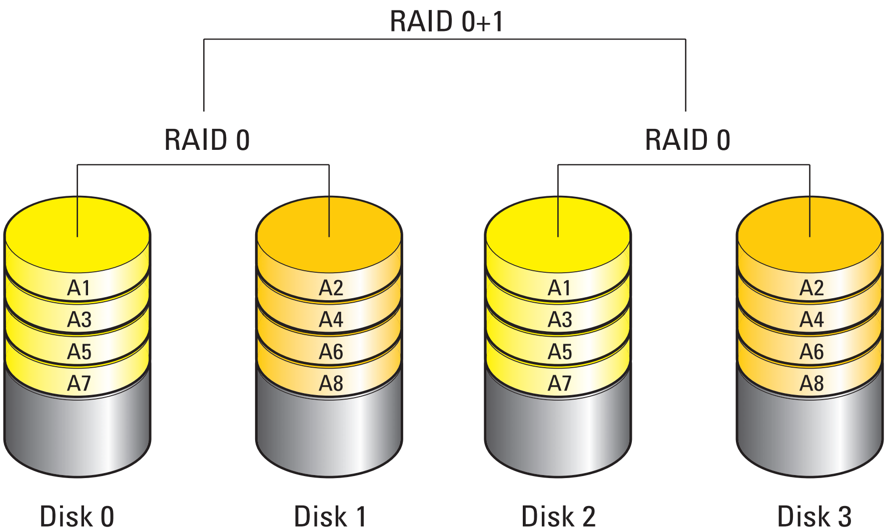


If a drive failure occurs, read and write operations are directed to the remaining drive. A replacement drive can then be rebuilt using the data from the remaining drive.

NOTE: In a RAID 1 configuration, the size of the configuration is equal to the size of the smallest drive in the configuration.

RAID Level 0+1 Configuration

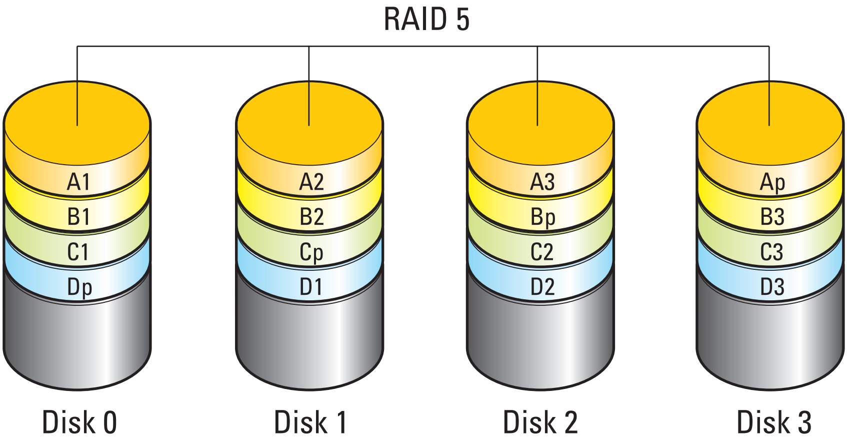
A RAID 0+1 array combines the high data access rate of a RAID level 0 array and the data protection (redundancy) of a RAID level 1 mirror by striping data across two drives and mirroring that striped data on a second set of two drives.



If a drive failure occurs, subsequent read and write operations are directed to the other surviving drives. A replacement drive can then be rebuilt using the data from the surviving drives. Also, because data is duplicated on the primary and additional drives, four 120-GB RAID level 1 drives collectively have a maximum of 240-GB on which to store data.

RAID Level 5 Configuration

RAID level 5 uses data parity. RAID level 5 stripes both data and parity information across three or more drives. It provides data striping at the byte level and also stripe error correction information (rotating parity array). This results in excellent performance and good fault tolerance.



If a drive failure occurs, subsequent read and write operations are directed to the other surviving drives. A replacement drive can then be rebuilt using the data from the surviving drives. Also, because data is duplicated on the primary and additional drives, four 120-GB RAID level 1 drives collectively have a maximum of 360-GB on which to store data.

Setting Your Computer to RAID-Enabled Mode

Before creating a RAID configuration, you must set your computer to RAID-enabled mode.

1. Enter the system setup program (see "Entering the System Setup Program" on page 308).
2. Press the up- and down-arrow keys to highlight **Drives**, and then press <Enter>.
3. Press the up- and down-arrow keys to highlight the applicable hard drive, and then press <Enter>.

4 Press the left- and right-arrow keys to highlight **RAID On**, and then press <Enter>.

5 Repeat the process, as needed, for each hard drive.

NOTE: Hard drives in a RAID configuration should be of equal size to avoid unallocated space.

6 Press <Esc>, press the left- and right-arrow keys to highlight **Save/Exit**, and then press <Enter> to exit the system setup program and resume the boot process.

Configuring RAID

Your computer can be configured for RAID, even if you did not select a RAID configuration when the computer was purchased. This can be done before or after the operating system is installed.

Depending on your computer, you will use either the NVIDIA (see "Using the NVIDIA Utilities" on page 88) or Intel (see "Using the Intel® RAID Utilities" on page 92) programs to create and manage RAID arrays.

Using the NVIDIA Utilities

If installed on your system, see the following sections for information about using the NVIDIA utilities.

- "Assigning Drives to a RAID Array Before Installing the Operating System" on page 88.
- "Assigning New Drives to a RAID Array With the Operating System Installed" on page 90.
- "Deleting a RAID Array" on page 90.
- "Converting From One RAID Configuration to Another RAID Configuration" on page 91.
- "Rebuilding a RAID Configuration (RAID 1 only)" on page 92.

Assigning Drives to a RAID Array Before Installing the Operating System

NOTICE: The following procedure deletes all data on your hard drive(s). Back up any data you want to keep before continuing.

1 Enable RAID for each applicable hard drive on your computer (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Restart the computer.

3 Press <Ctrl><n> when prompted to enter the RAID BIOS.

The **Define a New Array** window appears.

NOTE: If the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, and then shut down your computer and try again.

4 Press <Tab> to navigate to the **RAID Mode** field.

To create a RAID 0 configuration, use the arrow keys to select **Striping**.

To create a RAID 1 configuration, use the arrow keys to select **Mirroring**.

5 Press <Tab> to navigate to the **Free Disks** field.

6 Use the up- and down-arrow keys to select a hard drive to include in the RAID array and then use the right-arrow key to move the selected drive from the **Free Disks** field to the **Array Disks** field. Repeat these steps for each disk you want to include in the RAID array.

NOTE: The number of drives supported in each RAID array varies, depending on what computer you have.

7 After assigning the hard drives to an array, press <F9>.

The **Clear disk data** prompt appears.

NOTICE: You lose all data on the selected drives in the next step. Back up any data you want to keep before continuing.

8 Press <y> to clear all data from the selected drives.

The **Array List** window appears.

9 To review the details of the array that you set up, use the arrow keys to highlight the array in the **Array Detail** window and press <Enter>.

The **Array Detail** window appears.

NOTE: To delete an array, use the arrow keys to select the array and press <d>.

10 Press <Enter> to return to the previous screen.

11 Press <Ctrl><x> to exit the RAID BIOS.

Assigning New Drives to a RAID Array With the Operating System Installed

Use Nvidia MediaShield to create a RAID configuration only when you are adding one or more new hard drives to an existing (non-RAID) single-drive computer, and you want to configure the new drive(s) into a RAID array.

NOTICE: The following procedure deletes all data on your hard drive(s). Back up any data you want to keep before continuing.

1 Enable RAID on your hard drives (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 After restarting your computer, launch Nvidia MediaShield.

3 Click **Create** under **System Tasks**.

   The **NVIDIA Create Array Wizard** screen appears and lists the disks that are available for configuration.

4 Click **Next**→ **Custom**→ **Next.**

5 Use the drop-down box to select **Striping** (RAID 0) or **Mirroring** (RAID 1).

6 Click **Next**.

   The **Free Disk Selection** window appears.

   NOTE: Only RAID-enabled hard drives are listed as free disks.

7 Click to select the drives that will make up the RAID configuration, click **Next**, and then click **Next** again.

   NOTE: The number of drives supported in each RAID array varies, depending on what computer you have.

   The **Clearing System Data** window appears.

NOTICE: The **Clear System Data** option deletes all data on the selected drive. Back up any data you want to keep before continuing.

8 Click **Next**→ **Finish** to create the RAID configuration.

   The MediaShield RAID management utility window appears and lists the array along with any other installed hard drives.

Deleting a RAID Array

Deleting a RAID 1 volume splits the volume into two non-RAID hard drives with a partition, and leaves any existing data intact.

NOTICE: Deleting a RAID 0 volume destroys all data on the volume. Back up any data you want to keep before continuing.

NOTICE: If your computer currently boots to RAID and you delete the RAID volume, your computer will not boot.

1. Launch Nvidia MediaShield.
2. Click to select the array you want to delete.
3. Click **Delete Array** in the **System Tasks** pane.

   The **NVIDIA Delete Array Wizard** screen appears.

4. Click **Next**.

   A confirmation screen appears with the name and size of the array that you have marked for deletion.

5. Click **Finish** to delete the RAID configuration.

   The MediaShield RAID management utility window appears and lists any remaining arrays along with any other installed hard drives.

Converting From One RAID Configuration to Another RAID Configuration

You can change the current state of a disk or array — from striped to mirrored, for example — without losing any data. Also, you can add hard drives to an existing array.

The time to convert an array depends on several factors, such as the speed of the processor, the type and size of the hard drive being used, and the operating system.

NOTICE: Additional hard drives to be used in the array must be no smaller than any of the drives in the current configuration.

1. Ensure that all drives to be used in the RAID configuration are RAID-enabled (see "Setting Your Computer to RAID-Enabled Mode" on page 87).
2. Launch Nvidia MediaShield.
3. Click to select the array you want to convert.
4. Click **Convert Array** in the **System Tasks** pane.

   The **NVIDIA Convert Array Wizard** screen appears.

5. Click **Next**.

6 Under **RAID Mode Selection**, select **Mirroring** or **Striping** from the drop-down menu.

7 Click **Next**.

NOTICE: You lose all data on the drives selected in the next step. Back up any data you want to keep before continuing.

8 Under **Free Disk Selection**, click the check box next to the hard drive(s) you want to include in the array.

9 Click **Finish**.

The MediaShield RAID management utility window appears and displays the status of the upgrade/migration process along with any other installed hard drives.

Rebuilding a RAID Configuration (RAID 1 only)

If one of the hard drives in a RAID 1 array fails, you can rebuild the array by restoring the data to a replacement drive.

1 Launch Nvidia MediaShield.

2 Click to select your RAID configuration (**Mirroring**) in the management utility window.

3 Select **Rebuild Array** in the **System Tasks** pane.

The **NVIDIA Rebuild Array Wizard** screen appears.

4 Click **Next**.

5 Select the hard drive you want to rebuild by clicking the check box beside it.

6 Click **Next**→ **Finish.**

The MediaShield RAID management utility window appears and displays the status of the rebuild.

NOTE: You can use your computer while the computer is rebuilding the array.

Using the Intel® RAID Utilities

If installed on your system, see the following sections for information about using the Intel utilities.

- "Configuring a RAID 0 or RAID 1 Array Before Installing the Operating System" on page 93.

- "Creating a RAID Level 0 Configuration With the Operating System Installed" on page 94.
- "Creating a RAID Level 0 Configuration With the Operating System Installed" on page 94.
- "Creating a RAID Level 1 Configuration With the Operating System Installed" on page 95.
- "Recovering From a Single Hard Drive Failure (RAID 1)" on page 95.
- "Migrating to a RAID Level 0 Configuration" on page 96.
- "Migrating to a RAID Level 1 Configuration" on page 97.

Configuring a RAID 0 or RAID 1 Array Before Installing the Operating System

NOTICE: You lose any data on your hard drives when you create a RAID configuration using the following procedure. Back up data that you want to keep before continuing.

NOTICE: Use the following procedure only if you are reinstalling your operating system. Do not use the following procedure to migrate an existing storage configuration to RAID level 0 configuration.

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Press <Ctrl><i> when you are prompted to enter the Intel RAID Option ROM utility.

3 Press the up- and down-arrow keys to highlight **Create RAID Volume**, and press <Enter>.

4 Enter a RAID volume name or accept the default, and press <Enter>.

For RAID 0

a Press the up- and down-arrow keys to select **RAID0 (Stripe).**

NOTE: Select the stripe size closest to the size of the average file that you want to store on the RAID volume. If you do not know the average file size, choose 128 KB as your stripe size.

b Press the up- and down-arrow keys to change the stripe size and press <Enter>.

For RAID 1

Press the up- and down-arrow keys to select **RAID1 (Mirror)**.

5 Select the desired capacity for the volume and press <Enter>.

The default value is the maximum available size.

6 Press <Enter> to create the volume.

7 Press <y> to confirm that you want to create the RAID volume.

8 Confirm that the correct volume configuration is displayed on the main Intel RAID Option ROM utility screen.

9 Press the up- and down-arrow keys to select **Exit** and press <Enter>.

10 Install the operating system (see "Restoring Your Operating System" on page 265).

Creating a RAID Level 0 Configuration With the Operating System Installed

NOTE: When you perform this operation, all data on the RAID drives will be lost.

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Click **Start**→ **Programs**→ **Intel(R) Matrix Storage Manager**→ **Intel Matrix Storage Console**.

NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode.

3 On the **Actions** menu, select **Create RAID Volume** to launch the Create RAID Volume Wizard, and then click **Next**.

4 On the **Select Volume Location** screen, select the first hard drive you want to include in your RAID level 0 volume, and then click the right arrow.

5 Select a second hard drive to include in your RAID level 0 volume, and then click the right arrow. The selected hard drives appear in the **Selected** window. Click **Next**.

NOTE: To add a third hard drive in your RAID level 0 volume, follow the above step after selecting the third hard drive.

6 In the **Specify Volume Size** window, click the **Volume Size** desired, and then click **Next**.

7 Click **Finish** to create the volume, or click **Back** to make changes.

Creating a RAID Level 1 Configuration With the Operating System Installed

NOTE: When you perform this operation, all data on the RAID drives is lost.

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Click **Start**→ **Programs**→ **Intel(R) Matrix Storage Manager**→ **Intel Matrix Storage Console**.

  NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode.

3 On the **Actions** menu, select **Create RAID Volume** to launch the Create RAID Volume Wizard.

4 Click **Next** at the first screen.

5 Confirm the volume name, select **RAID 1** as the RAID level, and then click **Next** to continue.

6 On the **Select Volume Location** screen, click the first hard drive you want to use, and then click the right arrow.

7 Click a second hard drive until two drives appear in the **Selected** window, and then click **Next**.

8 In the **Specify Volume Size** window, select the **Volume Size** desired and click **Next**.

9 Click **Finish** to create the volume, or click **Back** to make changes.

10 Follow the Microsoft Windows procedures for creating a partition on the new RAID volume.

Recovering From a Single Hard Drive Failure (RAID 1)

NOTE: Perform the following steps only after you have replaced the failed hard drive (see the appropriate "Drives" section for your computer).

1 Turn on or restart your computer.

2 Press <Ctrl><i> when you are prompted to enter the Intel RAID Option ROM utility.

3 Under **DEGRADED VOLUME DETECTED**, confirm that the new (non-RAID) drive is listed and then press <Enter>.

4 Under **Disk/Volume Information**, confirm that the volume status is *Rebuild*.

NOTE: Volumes with a status of *Rebuild* are rebuilt within the operating system.

5 Use the up- and down-arrow keys to select **Exit**, and then press <Enter>.

Your computer boots to the operating system and begins rebuilding the RAID volume automatically.

NOTE: You can use your computer while the computer is rebuilding the RAID 1 volume.

Migrating to a RAID Level 0 Configuration

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Click **Start**→ **All Programs**→ **Intel(R) Matrix Storage Manager**→ **Intel Matrix Storage Console**.

NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode.

3 On the **Actions** menu, select **Create RAID Volume From Existing Hard Drive** to launch the Migration Wizard.

4 Click **Next** on the **Migration Wizard** screen.

5 Enter a RAID volume name or accept the default.

6 From the drop-down box, select **RAID 0** as the RAID level.

7 Select the appropriate stripe size from the drop-down box, and then click **Next**.

The stripe size should be closest to the size of the average file you want to store on the RAID volume. If you do not know the average file size, choose 128 KB as your stripe size.

8 On the **Select Source Hard Drive** screen, double-click the hard drive from which you want to migrate, and click **Next**.

This drive should be the hard drive containing the data or operating system files that you want to keep on the RAID volume.

9 On the **Select Member Hard Drive** screen, double-click the hard drive(s) to select the member drive(s) to span the stripe array, and click **Next**.

10 On the **Specify Volume Size** screen, select the **Volume Size** you want, and click **Next**.

NOTICE: In the following step, all data contained on the member drive is removed.

11 Click **Finish** to start migrating, or click **Back** to make changes.

NOTE: You can use your computer normally during the migration process.

Migrating to a RAID Level 1 Configuration

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 87).

2 Click **Start**→ **All Programs**→ **Intel(R) Matrix Storage Manager**→ **Intel Matrix Storage Console** to launch the Intel Storage Utility.

NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode.

3 On the **Actions** menu, click **Create RAID Volume From Existing Hard Drive** to launch the Migration Wizard.

4 Click **Next** on the first **Migration Wizard** screen.

5 Enter a RAID volume name or accept the default.

6 From the drop-down box, select **RAID 1** as the RAID level.

NOTE: Select the hard drive that you want to use as your source hard drive (it should be the hard drive containing the data or operating system files that you want to keep on the RAID volume).

7 On the **Select Source Hard Drive** screen, double-click the hard drive from which you want to migrate, and click **Next**.

This drive should be the hard drive containing the data or operating system files that you want to keep on the RAID volume.

8 On the **Select Member Hard Drive** screen, double-click the hard drive to select the member drive that you want to act as the mirror in the configuration, and click **Next**.

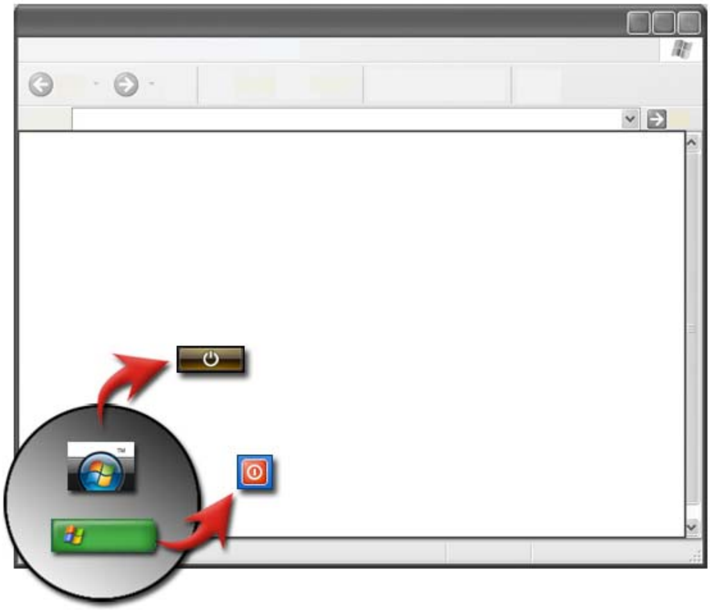
9 On the **Specify Volume Size** screen, select the volume size you want, and click **Next**.

NOTICE: In the following step, all data contained on the member drive is removed.

10 Click **Finish** to start migrating, or click **Back** to make changes.

NOTE: You can use your computer normally during migration process.

Shutting Down Your Computer



Ensure that you shut down the Microsoft® Windows® operating system before you turn off the computer.

Windows Vista®

1 Save and close all open files and close all programs.

2 Click **Start**  and move the mouse pointer to the arrow next to the lock button.

3 Click **Shut Down**.

Windows® XP

1 Save and close all open files and close all programs.

2 Click **Start** and then select **Turn Off** menu.

3 The **Turn off computer** dialog box appears.

4 Click the **Turn Off** button to shut down the computer.

HINT: If your computer is not operating properly, restarting Windows often solves the problem.

FOR MORE INFORMATION: To learn more about turning off your computer properly in Windows, see Windows Help and Support: click **Start** or → **Help and Support**.

NOTE: Windows operating systems start automatically when you turn on the computer.

Shutdown States

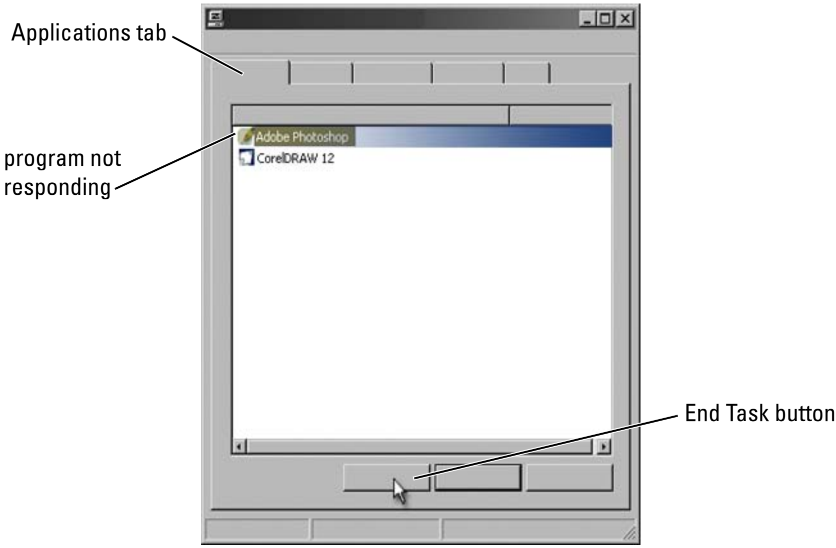
Microsoft® Windows Vista®

Sleep	Sleep is a power-saving state, or mode. Sleep saves all open documents and programs, and allows the computer to quickly resume full-power operation (typically within several seconds) when you want to start working again.
Shut Down	Use shut down only when you must turn off the power to your computer, for example, when you want to add memory or you don’t plan to use the computer for several days.

Windows® XP

Standby	Standby is a state in which the display and hard disks turn off, so that your computer uses less power. When you want to use the computer again, it comes out of standby quickly, and your desktop is restored exactly as you left it. Because standby does not save your desktop state to disk, a power failure while on standby can cause a loss of unsaved information.
Hibernation	Hibernation is a state in which your computer shuts down to save power but first saves everything in memory on your hard disk. When you restart the computer, your desktop is restored exactly as you left it. Use hibernation to save power when you will be away from the computer for an extended time while working.
Shut Down	Use shut down when you must turn off the power to your computer. This action shuts down Windows so that you can safely turn off the computer power.

Ending a Program That is not Responding



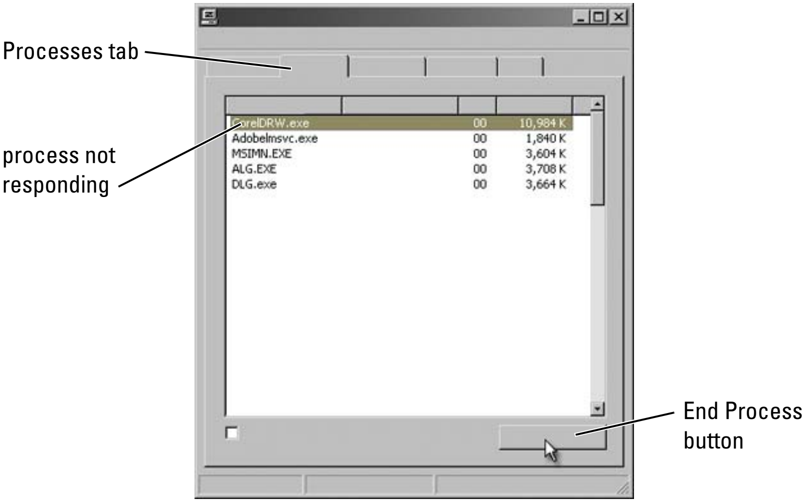
If a program on your computer stops responding or appears frozen, Windows will try to find the problem and fix it automatically. In order to continue work, you may have to end (terminate) the program. You can terminate the program by using the Task Manager utility.

1 Right-click the taskbar, and click **Task Manager**.
2 The **Task Manager** window appears.
3 In the **Applications** tab, select the program that is not responding and then click **End Task**.

NOTE: Any data entered or changes made in that program and not saved will be lost.

FOR MORE INFORMATION: To learn more about Task Manager, see Windows Help and Support: click Start or → Help and Support.

Ending a Process That is not Responding



Use the Task Manager to end (terminate) processes that have stopped responding. A process can be a program, such as Windows Explorer, or a service, such as MSTask.

1 Right-click the taskbar, and click **Task Manager**→ **Processes** tab.

2 In the **Process** tab, select the process that is not responding and then click **End Process**.

HINT: Be careful when ending a process. If you end a process associated with an open program, the program will also close and you will lose any unsaved data. If you end a process associated with a system service, some part of the system may not function properly.

FOR MORE INFORMATION: To learn more about what to do when a process does not respond, see Windows Help and Support: click Start or → Help and Support.

Docking and Undocking Your Laptop Computer

Undocking Your Computer While it is Running— Hot Undocking

Advanced Configuration and Power Interface (ACPI) is a form of power management, that enables the operating system to control the amount of power given to each device attached to the computer.

If your computer is ACPI-enabled, you can undock it while it is still running, without shutting down open applications or programs.

To determine if your computer is ACPI-enabled:

Windows Vista

1. Click **Start** → **Control Panel**→ **System and Maintenance**→ **System**→**Device Manager** (listed under Tasks).
2. If a window appears asking for permission to continue, click **Continue**.
3. Look for the **System devices**. If your computer is ACPI-enabled, ACPI will appear next to the device name.

Windows XP

1. Click **Start** → **Control Panel**→ **Performance and Maintenance.**
2. Click **Administrative Tools**→ **Computer Management**→ **Device Manager**.
   OR
   Click **System**→ **System Properties**→ **Hardware**→ **Device Manager**.
3. Look for the **System devices**. If your computer is ACPI-enabled, ACPI will appear next to the device name.

> **FOR MORE INFORMATION:** To learn more about undocking your laptop computer, see the documentation that came with your computer and the documentation that came with your docking station.

Undocking Without Shutting Down

1. Save any open files.

2 Click **Start** → **Undock Computer** and wait until the system confirms that the computer is ready to be undocked.

3 Remove the computer from the docking station.

HINT:
1) If the computer does not have power from a battery, the computer turns off when you undock it, and you lose unsaved data.

2) Never undock the computer without first preparing it. If you undock before preparing the computer, you lose unsaved data and the computer may not recover normal operation for several minutes.

3) Hot undocking is available only on computers that are ACPI-enabled.

Shutting Down Your Computer When it Fails to Shut Down Normally

You may not always be able to shut down successfully. When this happens, a program or process may be preventing your computer from shutting down. When shutting down, Windows will attempt to end all programs. If this is not successful, you may need to manually end a program and/or process using **Task Manager**.

Shutting Down a Stalled or "Frozen" Computer

Windows Vista

When you attempt to shut down, the screen may darken and show you which programs are preventing the computer from shutting down. It may also indicate why those programs are preventing your computer from shutting down.

- Click **Shut down now** to force all of the programs to end and complete the process of shutting down your computer. If you click **Shut down now**, you may lose data that you haven't saved.

OR

- Do not shut down. Click **Cancel** to return to Windows. If any of the programs that are preventing shutdown have data that you want to save, save it now. Then proceed to shut down the computer.

> **FOR MORE INFORMATION:** To learn more about shutting down your computer, see Windows Help and Support: click **Start** or → **Help and Support**.

Windows XP

When you attempt to shut down, Windows may display an **End Program** dialog box.

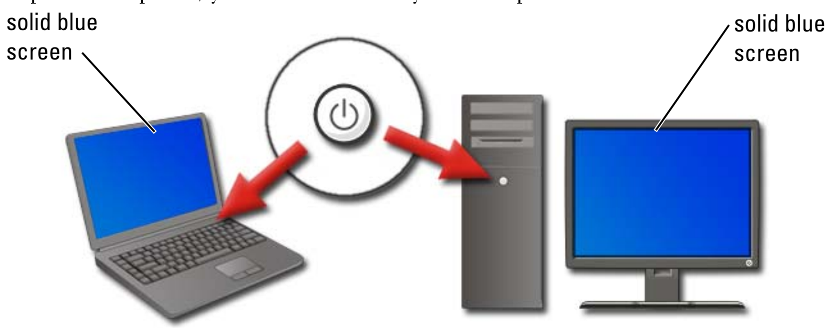
- Click **End Now** to end the program. If you choose to end the program immediately, you will lose unsaved data.

OR

- Do not shut down. Click **Cancel** to return to Windows. If any of the programs that are preventing shutdown have data that you want to save, save it now. Then proceed to shut down the computer.

Shutting Down a Computer When it Stops Responding and Displays a Solid Blue Screen

When an operating system experiences an unrecoverable error, the computer displays a blue screen containing error codes, and all computer operations stop. At this point, you must turn off your computer.



Press and hold the power button for at least 8 seconds. Also, you may want to remove and replace the battery for a laptop computer to ensure that power is off and components will reset when the power is turned back on. See "Replacing a Battery" on page 143.

HINT: If an error message is displayed when the computer stops responding, write down the message. This will help you troubleshoot the problem later.

The error reporting dialog box will be displayed after you restart your computer. Write down any error messages that may be displayed.

NOTE: Unsaved data associated with active programs will be lost.

FOR MORE INFORMATION: To learn more about shutting down your computer, see:

- Windows Help and Support: click **Start** or → **Help and Support**
- "Maintenance Tasks (Enhance Performance and Ensure Security)" on page 125
- Your system administrator
- **support.dell.com.**

Starting Your Computer in Safe Mode

Safe mode is a troubleshooting option for Windows that starts your computer in a limited state. Only the basic files and drivers necessary to run Windows are started.

You may want to start your computer in Safe Mode if you have shut down with a frozen blue screen.

The words "Safe Mode" appear in the corners of the display to identify which Windows mode you are using. If an existing problem does not reappear when you start in Safe Mode, you can eliminate the default settings and basic device drivers as possible causes.

Access the Safe Mode by pressing and holding the <F8> key while your computer restarts.

Restarting Your Computer After a Power Loss

> **FOR MORE INFORMATION:** To learn more about Safe Mode, see Windows Help and Support: click **Start** or → **Help and Support**.

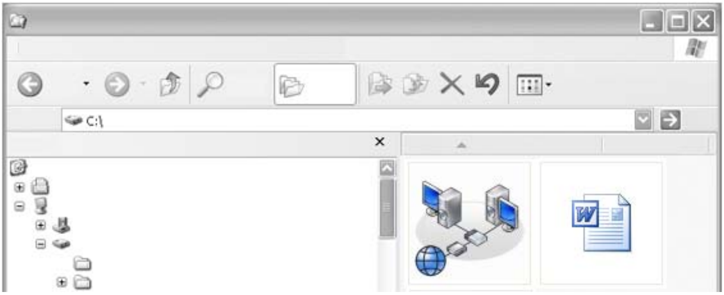
If your computer suffers a power loss, it may restart and display a series of messages.

- If you were working in an application, a message may ask you to choose a version of the document to save.
- If you had an application or program open, a message may tell you that the program did not shut down properly. You may need to shut the program down and restart your computer.

> **FOR MORE INFORMATION:** To learn more about how to manage power options on your computer, see:
>
> - Windows Help and Support: click Start or → Help and Support
> - "Maintenance Tasks (Enhance Performance and Ensure Security)" on page 125
> - "Power (Power Settings, Power Protection Devices, and Batteries)" on page 135.

8

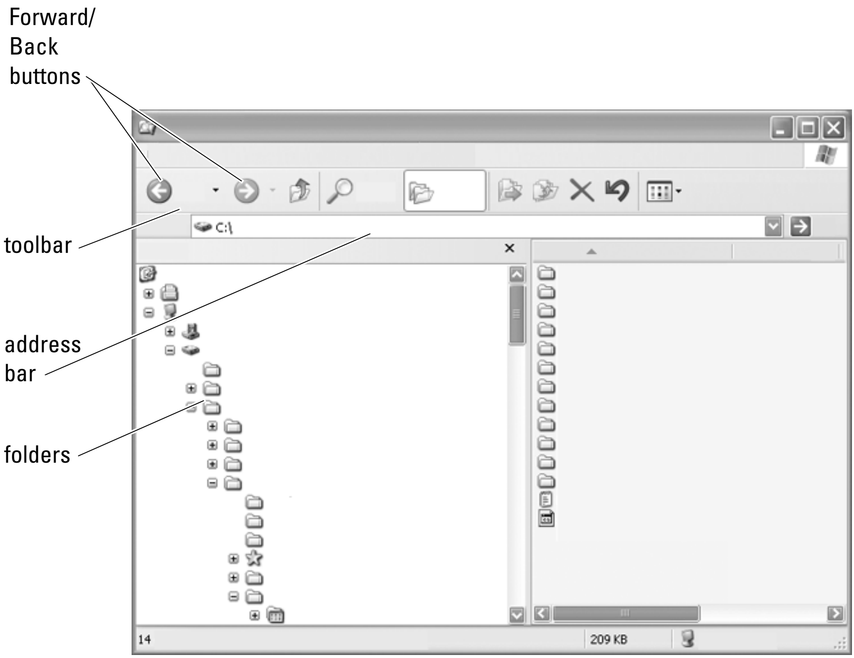
Files and Folders



Files are documents, photos, or graphics stored on your computer. A folder is a group of multiple files.

FOR MORE INFORMATION: To learn more about how to open, copy, and delete files and folders, see Windows Help and Support: click Start or → Help and Support.

Navigating to Files



Use Microsoft® Windows® Explorer to view and find files and folders available on your computer.

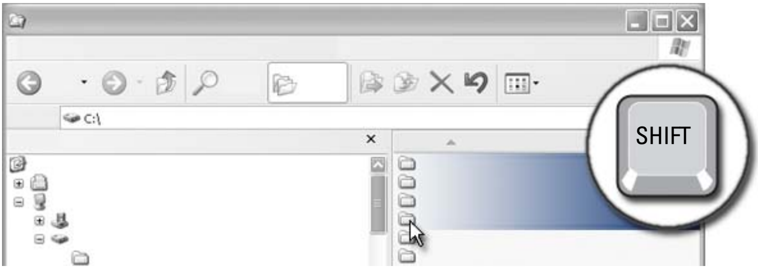
FOR MORE INFORMATION: To learn more about using the Windows Explorer utility, see Windows Help and Support: click Start or → Help and Support.

In Windows Explorer, use the **Forward** and **Back** buttons above the Address Bar to navigate to files you previously viewed.

Selecting and Opening Files

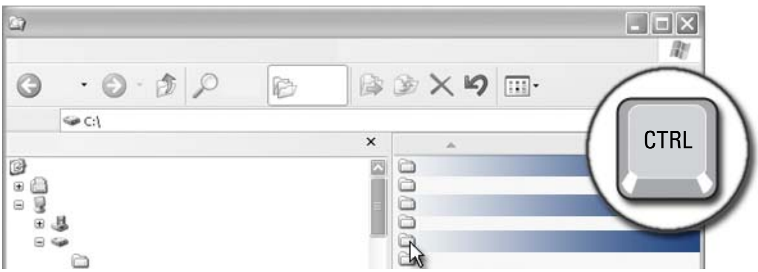
To open a file, you first need to select the file. To select a file, click the filename one time. Selected files appear highlighted. To open the file, double-click the selected filename.

Selecting a Group of Files



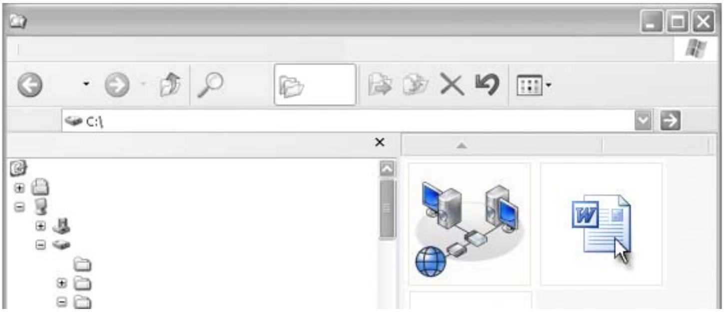
Click the first file you want included in the group. Press and hold down the **<Shift>** key as you click the last file to include in the group. All the files in the group are highlighted.

Selecting Several Random Files



Click a file you want to select. Press and hold down the <Ctrl> key as you click each file. All the files you selected are highlighted.

Opening and Saving a File



Double-click on a file you want to open. When you finish working with the file, perform the following to save the file: Click **File**→ **Save**. Click the **X** in the upper-right corner to close the file.

NOTE: Clicking the X in the upper right corner of an application rather than a particular file in the application, closes all the open files in the application.

HINT: To save file with a different name, Click File→ Save As. Type a name for the file in the File name box and click Save.

Opening a Graphic Image (Picture or Art)

When you double-click on a graphic (such as a photo) to open it, it appears in the Windows Picture and Fax Viewer window. To make changes to the graphic, you will need to open it within the program used to create it or in another graphic editing program.

Finding Files

If you are unsure where a file is saved, you can use the **Search** option.

Searching for a File

Windows Vista®

1 Click **Start** → **Search**.

2 In the **Search Results** window, click **All**.

3 Type the filename or part of the filename in the Search box.

4 Type a word or part of a word in the **Search** box.

5 Press**<Enter>** or click the magnifying glass

To search for a picture:

1 Click **Start** → **All Programs** →**Windows Photo Gallery**.

Windows® XP

1 Click **Start**  → **Search.**

2 Under **Search Companion**, select the type of item you want to search for.

3 Enter a name and click **Search**.

Renaming Files

You should not rename files that the operating system or other programs require to operate.

1 Right-click the file you want to rename.

2 Click **Rename** from the drop-down menu.

3 Type a new name for the file and press the <Enter> key.

Printing Files

1 Open the file you want to print, and select **File**→**Print**.

2 Specify the print settings and click **OK**.

Deleting Files

1 Click the file you want to delete.

2 Press the **Delete** key. The **Confirm File Delete** dialog box appears.

3 The selected file is deleted.

HINT: When you delete a file, Windows places the file in the Recycle Bin in case you need to restore the file. To permanently delete a file, empty the Recycle Bin. To empty the Recycle Bin, double-click the Recycle Bin icon and select Empty Recycle Bin from the File menu.

Sharing Files



Windows Vista

1 Click one or more files or folders that you want to share, and click **Share**.

2 In the **File Sharing** dialog box, click one of the following:

- **On the same computer:** Type the name of the person you want to share files with, and click **Add**.
- **On a domain — individuals:** Click the arrow to the right of the text box, and then click **Find**. Type the name of the person you want to share files with, click **Check Names**, and click **OK**.
- **On a domain — everyone:** Click the arrow to the right of the text box, click **Everyone**, and click **Add**.
- **On a workgroup**: Click the arrow to the right of the text box, click the person's name, and click **Add**.

You may have to create a new user account to share files with some users.

3 Under **Permission Level**, click the arrow next to each person or group and select sharing permissions:

- A **Reader** can view shared files, but not add, alter, or delete them.
- A **Contributor** can view or add shared files, but can only alter or delete files he or she has contributed.

- A **Co-owner** can view, add, alter, or delete any shared file.

4 Click **Share**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

5 If a window appears asking for permission to continue, click **Continue**.

6 After you receive confirmation that your folder is shared, send a link to the shared files to the people you are sharing them with.

7 Click **Done**.

NOTE: If you change the name of a shared file or folder, send a link to the new location to those sharing the file or folder.

Windows XP

1 Click **Start** → **My Documents**.

2 Select the file or folder that you want to share and drag it to **Shared Documents** in the **Other Places** box.

HINT: To learn more about sharing folders or documents, click the Shared Documents option under the File and Folder Tasks box. Then click on the sharing and security link on the Shared Documents Properties window. This action takes you to the Windows Help and Support screen.

Sharing Files With Password Protection.

If your computer is part of a workgroup, you have the option of turning password protection on or off.

If password protection is turned on, the person you are sharing with must have a user account and password on your computer in order to access the files and folders you are sharing.

Restricting Access to a File

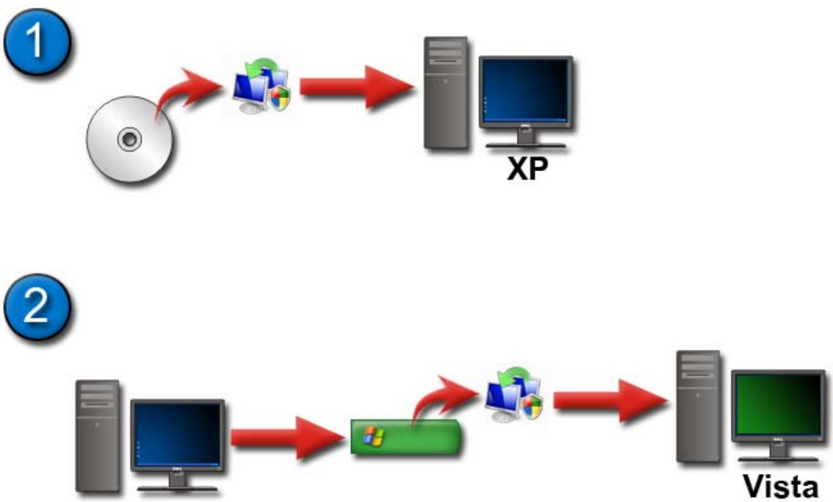
You can restrict who has access to folders or files by setting permissions for the specified file or folder.

1 Locate the folder or file for which you want to set permissions and right-click on it.

2 Click **Properties**→ **Security** to remove permissions from a group or user, click on the required group or user and click **Remove**.

FOR MORE INFORMATION: To learn more about setting permissions, see "Administrator Rights" on page 251.

Transferring Files and Settings to a New Computer



Transferring Files From a Computer Running Windows XP to a Computer Running Windows Vista

1 Install Windows Easy Transfer from the Windows Vista DVD on the computer running Windows XP.

2 After the installation is complete, click **Start**  → **Windows Easy Transfer**.

3 Click **Continue** on the **User Account Control** dialog box and follow the instructions on the **Windows Easy Transfer** wizard.

If **Windows Easy Transfer** is not listed in the **Start** menu, use the Control Panel to access the **Windows Easy Transfer** wizard:

1 Click **Start** → **Control Panel** → **System and Maintenance** → **Welcome Center** → **Transfer files and settings**.

2 Click **Continue** on **User Account Control** dialog box and follow the instructions on the **Windows Easy Transfer** wizard.

Transferring Files Between Computers Running Windows XP

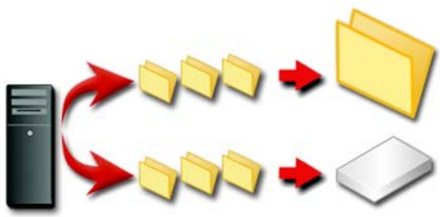
To transfer files and folders from one computer to another using the **Files and Settings Transfer** wizard in Windows XP:

1 Click **Start** → **All Programs** → **Accessories** → **System Tools**.

2 Select **Files and Settings Transfer Wizard**.

3 Follow the instructions on the wizard.

Backing up Files



You can back up your entire computer or just certain files and folders.

Windows Vista

1 Click **Start** → **Control Panel** → **System and Maintenance** → **Welcome Center** → **Transfer files and settings**.

2 Click **Back up files** or **Back up computer**.

3 Click **Continue** on **User Account Control** dialog box and follow the instructions on the **Back up Files** wizard.

Windows XP

1 Click **Start**  → **All Programs** → **Accessories** → **System Tools** → **Backup**.

2 Click **Advanced Mode** in the **Backup or Restore Wizard**.

3 On the **Backup** tab→ **Job**→ **New**.

4 Specify the files and folders you want to back up by selecting the check box to the left of a file or folder in **Click to select the check box for any drive, folder, or file that you want to back up**.

5 In **Backup destination**, do one of the following:

- Click **File** if you want to back up files and folders to a file. This option is selected by default.
- Click a tape device if you want to back up files and folders to a tape.

6 In **Backup media or file name**, do one of the following:

- If you are backing up files and folders to a file, type a path and file name for the backup (.bkf) file, or click the **Browse** button to find a file.
- If you are backing up files and folders to a tape, click the tape you want to use.

7 Specify any backup options you want, such as the backup type and the log file type, by clicking the **Tools** menu, and then clicking **Options**.

8 When you have finished specifying backup options, click **OK**.

9 Click **Start Backup**, and then make any changes to the **Backup Job Information** dialog box. If you want to set advanced backup options such as data verification or hardware compression, click **Advanced**. When you have finished setting advanced backup options, click **OK**.

10 Click **Start Backup** to start the backup operation.

Running Backup When the Settings Have Been Preconfigured

If a backup procedure has been preconfigured, simply access the **Backup or Restore Wizard** and click **Next** and **Finish** where appropriate without changing settings. The wizard will take you through the options and then start the backup process.

Running Backup With Hidden Drives

NOTE: You cannot run backup for a drive that is "hidden".

To run backup in this situation, you must first unhide any hidden drives. To do so, open the program that you used to hide the drive and make the drive visible.

Restoring Files

You can restore your entire computer or just the files and folders on your computer.

Windows Vista

1. Click **Start** → **Control Panel** → **System and Maintenance** → **Backup and Restore Center**.
2. Click either **Restore files** or **Restore computer**.
3. Click **Continue** on **User Account Control** dialog box and follow the instructions on the **Restore Files** wizard.

Windows XP

1. Click **Start** → **All Programs** → **Accessories** → **System Tools** → **Backup**.
2. Click **Advanced Mode**.
3. On the **Restore and Manage Media** tab, select the files and folders you want to restore.
4. Select the location to restore your backed-up files and folders.
5. Select whether to replace existing files with the same name.
6. Click **Start Restore**.

9

Managing Applications (Programs)

Installing Applications on Your Computer



Installing Applications From a CD or DVD With Microsoft® Windows®

1. Insert the CD or DVD into your computer.
2. Follow the instructions on your screen.

   If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

   If an application does not install, look for the application's setup file, usually called **setup.exe** or **install.exe**, on the installation disk.

Installing (Downloading) Applications From the Internet



1. In your web browser, click the link to the application.

   If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

2. Click **Open** or **Run** and follow the instructions on your screen.

   or

Click **Save** and download the installation file to your computer to allow you to scan the file for viruses. To install the application, double-click the file and follow the instructions on your screen.

NOTICE: When downloading and installing applications from the Internet, be sure you trust the publisher of the application and the website that is offering the application.

Installing Applications From a Network



This topic only applies if your computer is connected to a network. If your computer is not connected to a network, you may see different options to select, such as **Get Programs Online** (for Windows Vista).

Windows Vista®

1 Click **Start** → **Control Panel**→ **Programs**, and then click **Get Programs Online**.

2 Select an application from the list, and click **Install**.

3 Follow the instructions on your screen.

Type the administrator password or provide confirmation, if prompted.

Windows® XP

1 Click **Start** → **Control Panel**→ **Add or Remove Programs**.

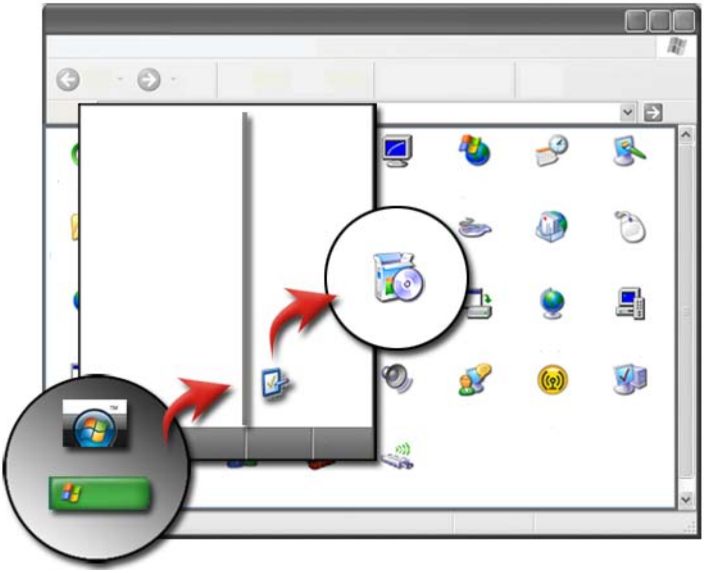
2 Click **Add a program**.

3 If your network administrator has organized the available programs into categories, you may need to select a different option in **Category** to see the program you want to add.

4 Select an application from the list, and click **Add**.

5 Follow the instructions on your screen.

Removing Applications From Your Computer



Windows Vista

1 Click **Start**  → **Control Panel**→ **Programs**→ **Programs and Features**.

2 Select the application you want to remove, and click **Uninstall**.

Type the administrator password or provide confirmation, if prompted.

Windows XP

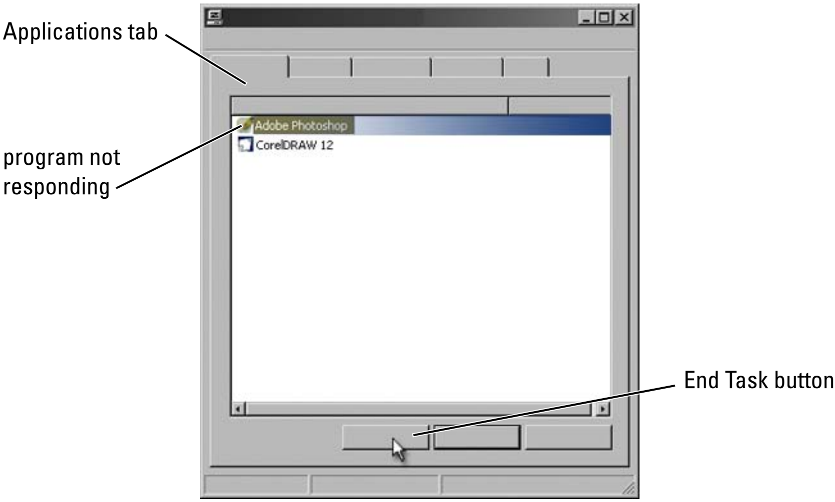
1 Click **Start**  → **Control Panel**→ **Add or Remove Programs**.

2 Click **Remove a program**, and select the application you want to remove.

3 Click **Remove**.

HINT: Simply deleting a program does not completely remove it from your computer. By deleting a program from your computer any way other than by using the Add or Remove Programs utility, you may accidentally delete drivers needed by other programs.

Ending an Application When it Does not Respond



If an application stops responding, Windows tries to find the problem and fix it automatically.

You can also end (or close) the application by using Task Manager:

1. Right-click the taskbar and select **Task Manager**.
2. On the **Applications** tab of the **Windows Task Manager** screen, click the application that is not responding, and then click **End Task**.

10

Maintenance Tasks (Enhance Performance and Ensure Security)

Performing Maintenance Tasks to Increase Computer Speed and Ensure Security



Your computer may begin to run slower over time. Slower performance can be caused by:

- Disorganized files
- Unnecessary software
- Unused network drives
- Too many programs that run automatically at startup

In addition, viruses can cause serious damage and dramatically slow your computer's performance.

You can protect your computer, increase its operational life, and enhance its performance, if you perform standard maintenance tasks, such as:

- Cleaning the computer and its components
- Disk defragmenting
- Scanning for virus and spyware

Tools are available through your computer's operating system to manage and improve its performance. Use this document as an overview of the options provided.

> **FOR MORE INFORMATION:** To learn more about maintenance tasks, see Windows Help and Support: click **Start** or → **Help and Support**.

Cleaning Your Computer

Before You Start

Read the safety instructions available in the Dell™ *safety information* that shipped with your computer.

Turn off and unplug the computer from the electrical outlet. For a laptop computer, remove any batteries.

Cleaning the Computer

To clean your computer, wipe the computer, keyboard, and plastic portion of the monitor with a soft cloth dampened with water.

Do not use aerosol cleaners, flammable liquid, or other spray cleaners. Do not allow water to drip inside the computer or keyboard.

> **FOR MORE INFORMATION:** To learn more about cleaning the individual components of your computer, see "Navigation Devices (Mouse, Keyboard, Touch Pad)" on page 57.

Cleaning Optical Drives and Optical Drive Media

> **NOTICE:** Always use compressed air to clean the lens in an optical drive, and follow the instructions that come with the compressed-air product. Never touch the lens in the drive.

If you notice problems, such as skipping, with the playback quality of your optical media, try cleaning the media.

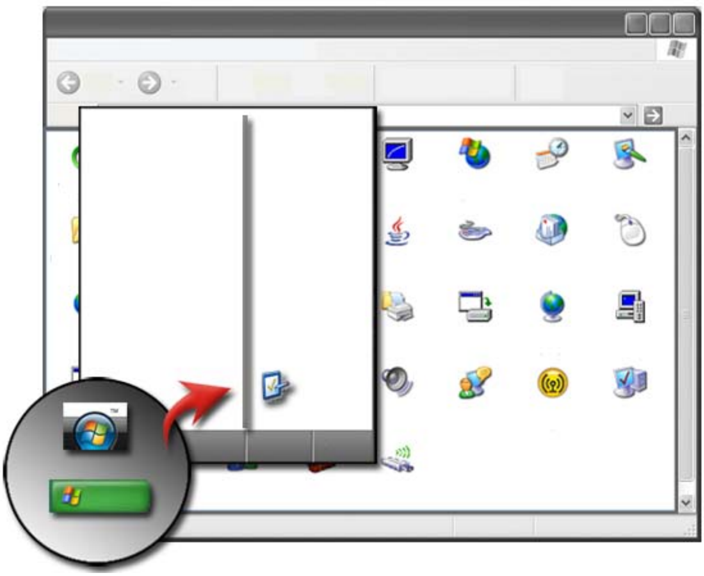
1 Hold the disc by its outer edge. You can also touch the inside edge of the center hole.

NOTICE: To avoid damaging the surface, do not wipe in a circular motion around the disc.

2 With a soft, lint-free cloth, gently wipe the bottom of the disc (the unlabeled side) in a straight line from the center to the outer edge of the disc.

For stubborn dirt, try using water or a diluted solution of water and mild soap. You can also purchase commercial products that clean discs and provide some protection from dust, fingerprints, and scratches. Cleaning products for CDs are also safe to use on DVDs.

Managing Your Computer Performance



The control panel provides the tools for you to manage and improve your computer's performance.

Windows Vista®

1 Click **Start** → **Control Panel**.

2 Click **System and Maintenance→ Performance Information and Tools**.

3 Use the following options in the **Tasks** area to improve your computer's performance:

Manage startup programs — disable some of your startup programs to improve performance.

Adjust visual effects — change how menus and windows appear to optimize performance.

Adjust indexing options — index options to help you find what you are looking for on your computer.

Adjust power settings — change power-related settings so that your computer resumes from power-saving settings more efficiently; and adjust battery usage for laptop computers.

Open Disk Cleanup — delete unnecessary or temporary files on your hard disk to increase the storage space on your computer.

Advanced tools — access advanced system tools, such as Event Viewer and System Information.

Windows® XP

1 Click **Start** → **Control Panel→ Performance and Maintenance→ Administrative Tools**.

2 Select one of the available options to perform maintenance and improve performance on your computer:

Component Services — system tools to monitor the status of system services, event viewer, and other processes running on your computer.

Computer Management — provides access to system tools, such as Device Manager, Disk Defragmenter, Disk Management, and other storage, and service system utilities.

Event Viewer — advanced system tool to view security, application, and system events to check for errors or problem areas.

Local Security Policy — advanced security tool to manage and update system security for passwords, local policies, local key policies, software restrictions, and IP security policies.

Performance — monitors your system performance to detect problems.

FOR MORE INFORMATION: To learn more about managing space on your hard drive by removing unused applications, see "Removing Applications From Your Computer" on page 123.

Performance Tuning

System Setup Based Performance Tuning

For some Dell systems, the settings available under the Advanced page of System Setup provide users with enhanced access to the options and controls that allow for computer performance to be manually tuned.

NOTICE: System Setup allows users unrestricted access when setting performance related parameters. Improperly configuring these settings or choosing options outside the capabilities of the installed components may cause system instability, reduced component operating life or permanent component damage.

For more information on accessing System Setup, see "System Setup" on page 307.

Software Based Performance Tuning

NVIDIA Enthusiast System Architecture (ESA) is a PC protocol for real-time monitoring and control of computer's thermal, electrical, acoustic and operating characteristics.

If your computer includes components compatible with ESA, Dell has pre-installed applications for monitoring and "tweaking" the performance of the components.

For more information about ESA, see **nvidia.com/object/nvidia_esa.html.**

NVIDIA Performance

The NVIDIA Performance application integrates many of the functions previously available in the NVIDIA nTune application into the Performance section of the NVIDIA Control Panel.

NOTE: When using the **Performance** section of the NVIDIA Control Panel, you may be required to accept an End User License Agreement.

Device Settings

When launched, the application detects installed ESA-compatible devices such as CPUs, video cards, memory, system board, and chassis components.

Selecting a component in the **Device Settings** interface displays the available settings and options for that component. Advanced users can manually tune these options to tailor and customize their system's performance. These settings can be saved to profiles to be recalled at a later time.

NOTICE: System Setup allows users unrestricted access when setting performance related parameters. Improperly configuring these settings or choosing options outside the capabilities of the installed components may cause system instability, reduced component operating life or permanent component damage.

Dynamic BIOS Access

This section of the NVIDIA Control Panel allows you to change available BIOS settings via a Windows user interface. Changes to these options and settings take effect on the next reboot.

View System Information

This section of the NVIDIA Control Panel allows you to view version information for the system and installed drivers. This information can be saved to a file for further review as well as technical support scenarios.

Profile Policies

The Profile Policies section allows you to define when and how profiles saved in the **Device Settings** sections are used.

LED Control

Through the **LED Control** section, you can customize the color and intensity of the chassis LEDs. You may also create, save and apply customized LED effects through this interface.

NVIDIA Monitor

The NVIDIA Monitor application allows you to monitor, track and log performance characteristics of compatible components inside your computer.

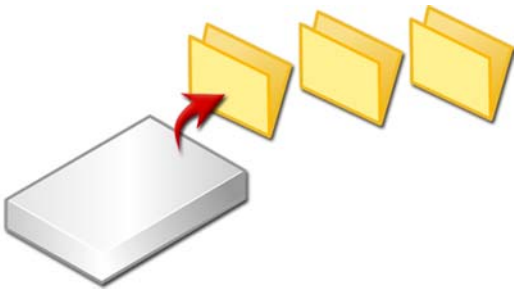
The data can be used to track the system's performance over time as well as evaluate the effectiveness of a change made to system configuration.

When launched the NVIDIA Monitor application detects installed ESA-compatible devices such as CPUs, video cards, memory, system board, and chassis components. Selecting a component in the interface displays real-time data for the available operating characteristics of that component. These characteristics may include voltages, fan speeds, usage, temperatures and more.

You can customize the NVIDIA Monitor to:

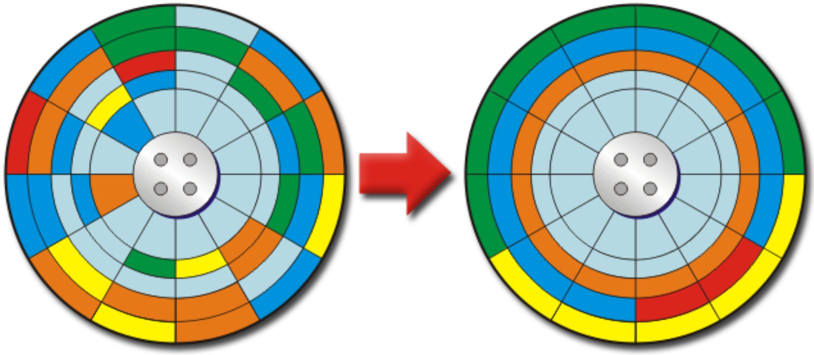
- Choose key performance characteristics to monitor, graph, and log.
- Set reporting intervals and performance thresholds.
- Configure and log user defined events.
- Customize application key strokes.

Cleaning Up Your Hard Drive



1. Click **Start** → **All Programs** → **Accessories** → **System Tools** → **Disk Cleanup**.
2. **Disk Cleanup** calculates how much space on your drive will be free if you run the cleanup.
3. Click **OK**.

Defragmenting Your Hard Drive



You can improve the performance of your computer by defragmenting your hard drive. This action enables your programs to run faster and your files to open more quickly.

> **HINT:** Why defragment a hard drive?
> A fragmented hard drive stores fragments of files in many different locations on the disk. The computer must search throughout the disk to retrieve the complete file. Disk Defragmenter combines all the parts of a file that are fragmented into one location. This reduces the time your computer spends to locate all the parts of a file and open it.

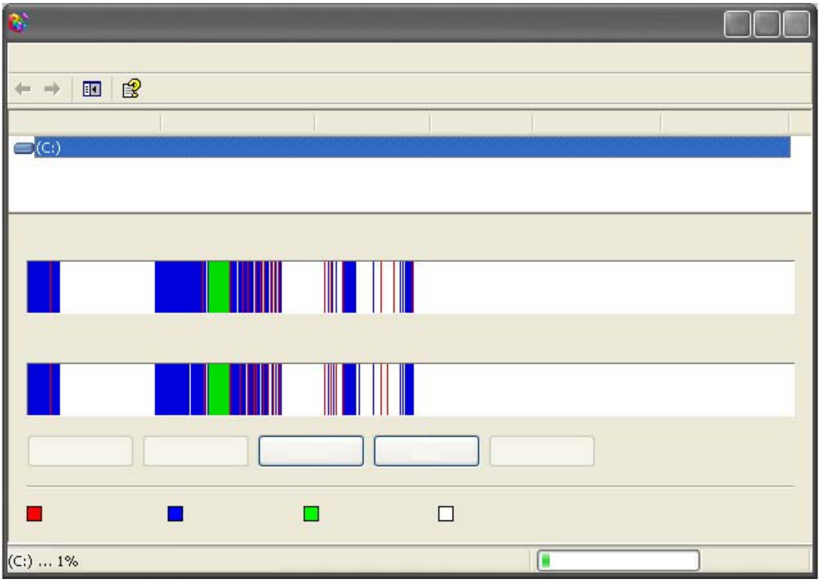
Before defragmenting the hard drive, Windows analyzes the disk to determine if you need to defragment it. You should perform this procedure at least once a week.

NOTE: If you perform this procedure regularly, the defragmenting process should take only 5 to 10 minutes.

1 Click **Start** → **All Programs** → **Accessories** → **System Tools** → **Disk Defragmenter**.

The **Disk Defragmenter** window opens. This window lists the hard drives on your computer along with the storage capacity and the amount of free space.

2 Select the drive you want to defragment and click **Analyze** to determine if you need to defragment the disk. Click **Defragment** to go ahead and defragment the disk.



NOTE: You should not use your computer during the defragmentation process.

Detecting and Repairing Disk Errors

1 Click **Start**→ **My Computer**.

2 On the **File** menu, select **Properties**.

3 On the **Tools** tab, click **Check Now**.

4 Select the actions you want to perform and click **Start**.

Scanning for Viruses and Spyware

Computer viruses and spyware are hidden software that corrupts your files or gathers information from your computer without your knowledge or consent.

Computer viruses affect your computer's performance, and can destroy data. If your computer has Internet access, you should install antivirus and antispyware programs.

FOR MORE INFORMATION: To learn more about protecting your computer from viruses, see "Viruses" on page 179.

Windows Defender is an antispyware application that:

- Checks your computer hard drive for locations infected by the spyware
- Checks all files on your hard disk for spyware
- Checks all currently running programs for spyware

FOR MORE INFORMATION: To learn more about Windows Defender, search for “Using Windows Defender” on the Microsoft website (www.microsoft.com). For more information about antivirus software, search for "antivirus software" on the Internet.

11

Power (Power Settings, Power Protection Devices, and Batteries)



Setting Power Options

Windows Vista®

Using Power Plans

Windows Vista provides three power plans that you can use or configure to meet your needs. Power plans manage how your computer uses power by saving energy, maximizing system performance, or achieving a balance between the two. The preconfigured power plans are:

- **Balanced** offers full performance when necessary and saves power during periods of inactivity.
- **Power saver** saves power by reducing system performance to maximize the life of the battery.
- **High performance** provides the highest level of performance by adapting processor speed to your activity and maximizing performance.

To select a power plan:

1 Click **Start** → **Control Panel** → **System and Maintenance** → **Power Options**.

2 Click the option you want to use.

> **FOR MORE INFORMATION:** To learn more about power plans, see Windows Help and Support: click **Start** or → **Help and Support**.

Power Management States

Sleep

Sleep saves power by saving your open documents and programs, and allowing your computer to quickly resume full operation when you are ready to start again.

To put your computer to sleep:

- Click **Start** and move the pointer to the arrow icon by the **Lock** button. Then click **Sleep**.

  OR

- Depending on how you set the power management options, you may also use one of the following methods to put your computer to sleep:
  - Press the power button.
  - Close the display for a laptop computer.
  - Press <Fn><Esc>.

To wake your computer, depending on how you set the power management options:

- Press the power button.

  OR

- Open the display for a notebook computer.

Hibernate

Hibernate conserves power by copying system data to a reserved area on the hard drive and then completely turning off the computer. When the computer exits hibernate mode, it returns to the same operating state it was in before entering hibernate mode.

NOTICE: You cannot remove devices or undock your computer while your computer is in hibernate mode.

Your computer enters hibernate mode if the battery charge level becomes critically low.

To manually enter hibernate mode:

- Click **Start** and move the pointer to the arrow icon by the **Lock** button. Then click **Hibernate**.

  OR

- Depending on how you set the power management options, you may also use one of the following methods to put your computer to sleep:
  - Press the power button.
  - Close the display for a notebook computer.
  - Press <Fn><Esc>.

NOTE: Some PC Cards or Express Cards may not operate correctly after the computer exits hibernate. Remove and reinsert the card, or simply restart (reboot) your computer.

To exit hibernate mode, press the power button. The computer may take a short time to exit hibernate mode.

FOR MORE INFORMATION: To learn more about configuring power options, see Windows Help and Support: click **Start** or → **Help and Support**.

Windows® XP

Configuring Your Power Settings

1 Click **Start** → **Control Panel** → **Performance and Maintenance** → **Power Options**.

2 In the **Power Options Properties** window, you can change the following information to best support your computer:

- **Power Schemes** — select preconfigured settings for your computer
- **Alarms** — set alarms for low or critical battery power (laptop computers)

- **Power Meter** — view the available battery power (laptop computers)
- **Advanced** — select options for advanced power settings
- **Hibernate** — select to enable or disable hibernation

FOR MORE INFORMATION: To learn more about configuring power option settings in Windows, see Windows Help and Support: click **Start** or → **Help and Support**.

Power Management Modes

Standby Mode

Standby conserves power by turning off the display and the hard drive after a predetermined period of inactivity (a time-out). When the computer exits standby, it returns to the same operating state it was in before entering standby.

NOTICE: If your computer loses AC and battery power while in standby, it may lose data.

To enter standby:

- Click **Start**→ **Turn off computer**→ **Stand by**.

  OR

- Depending on how you set the power management options, you may also use one of the following methods:
  - Press the power button.
  - Close the display for a notebook computer.
  - Press <Fn><Esc>.

To exit standby, depending on how you set the power management options:

- Press the power button.

  OR

- Open the display for a notebook computer.

Hibernate Mode

Hibernate conserves power by copying system data to a reserved area on the hard drive and then completely turning off the computer. When the computer exits hibernate, it returns to the same operating state it was in before entering hibernate.

NOTICE: You cannot remove devices or undock your computer while your computer is in hibernate mode.

Your computer enters hibernate if the battery charge level becomes critically low.

To manually enter hibernate:

- Click **Start** → **Turn off computer.** Then press and hold the <Shift> key, and click **Hibernate**.

  OR

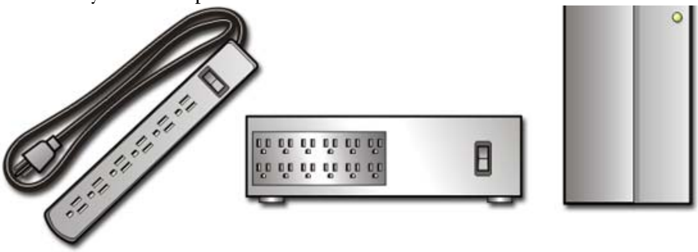
- Depending on how you set the power management options, you may also use one of the following methods to enter hibernate:
  - Press the power button.
  - Close the display for a notebook computer.
  - Press <Fn><Esc>.

NOTE: Some PC Cards or Express Cards may not operate correctly after the computer exits hibernate. Remove and reinsert the card, or simply restart (reboot) your computer.

To exit hibernate, press the power button. The computer may take a short time to exit hibernate.

Power Protection Devices

Interference or fluctuations in the power supplied to your computer can cause crashes and sometimes permanent damage to your computer. Surge protectors, power line conditioners, uninterruptible power supplies provide protection for your computer.



surge protector   power line conditioner   uninterruptible power supply

Surge Protector

Plug your computer power line into a surge protector or power strip equipped with surge protection to help prevent damage to your computer from voltage spikes that can occur during electrical storms or after power interruptions.

Some surge protector manufacturers include warranty coverage for certain types of damage. Carefully read the device warranty when choosing a surge protector. A device with a higher joule rating offers more protection. Compare joule ratings to determine the relative effectiveness of different devices.

NOTICE: Most surge protectors do not protect against power fluctuations or power interruptions caused by nearby lightning strikes. When lightning occurs in your area, disconnect the telephone line from the telephone wall jack and disconnect your computer from the electrical outlet.

Many surge protectors have a telephone jack for modem protection. See the surge protector documentation for modem connection instructions.

NOTICE: Not all surge protectors offer network adapter protection. Disconnect the network cable from the network wall jack during electrical storms.

Power Line Conditioner

NOTICE: Power line conditioners do not protect against power interruptions.

Plug your computer power line into a power line conditioner to compensate peaks and valleys in the power supply and reduce peaks in the power flow to your computer. Power line conditioners are different from the typical uninterruptible power supply in that they continuously charge the battery and continuously run the equipment off battery power.

Uninterruptible Power Supply (UPS)

NOTICE: Loss of power while data is being saved to the hard drive may result in data loss or file damage.

NOTE: To ensure maximum battery operating time, connect only your computer to a UPS. Connect other devices, such as a printer, to a separate power strip that provides surge protection.

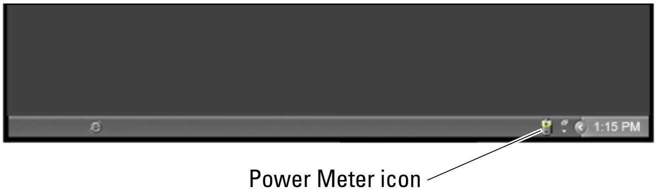
An uniterruptible power supply (UPS) protects against power fluctuations and interruptions. UPS devices contain a battery that provides temporary power to connected devices when AC power is interrupted. The battery charges while AC power is available.

See the UPS manufacturer documentation for information on battery operating time and to ensure that the device is approved by Underwriters Laboratories (UL).

Laptop Computer Batteries

To ensure optimal performance and to help preserve BIOS settings, operate your laptop computer with the main battery installed at all times. One battery is supplied as standard equipment in the battery bay.

Using Your Laptop Computer for the First Time



The first time you use your computer, use the AC adapter to connect your computer to an electrical outlet in case your battery is not fully charged. For best results, operate the computer with the AC adapter until the battery is fully charged. To view the battery charge status, check the Power Meter icon on the taskbar.

NOTE: To preserve battery power, connect your computer to an electrical outlet when writing to a CD or DVD.

Preserving the Life of a Battery

The operating time of a battery, which is the time the battery can hold a charge, varies depending on how you use your laptop computer. The following will significantly reduce the operating time of your battery:

- Using optical drives
- Using wireless communications devices, PC Cards, Express Cards, media memory cards, or USB devices
- Using high-brightness display settings, 3D screen savers, or other power-intensive programs such as complex 3D graphics applications
- Running the computer in maximum performance mode (see Maintaining Your Computer for ways to adjust optimize your computer performance).

The life of the battery decreases over time depending on how often the battery is used and the conditions under which it is used. You may need to purchase a new battery during the life of your computer.

For more information on preserving the battery life of your laptop computer, see "Dell™ ControlPoint Power Manager" on page 146.

Replacing a Battery

CAUTION: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell computer. Do not use a battery from other computers with your computer.

CAUTION: Do not dispose of batteries with household waste. When your battery no longer holds a charge, call your local waste disposal or environmental agency for advice on disposing batteries. See "Battery Disposal" in the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

CAUTION: Misuse of the battery may increase the risk of fire or chemical burn. Do not puncture, incinerate, disassemble, or expose the battery to temperatures above 65°C (149°F). Keep the battery away from children. Handle damaged or leaking batteries with extreme care. Damaged batteries may leak and cause personal injury or equipment damage.

CAUTION: Before performing these procedures, turn off the computer, disconnect the AC adapter from the electrical outlet and the computer, disconnect the modem from the wall connector and computer, and remove any other external cables from the computer.

NOTICE: You must remove all external cables from the computer to avoid possible connector damage.

Your battery will vary depending on your laptop computer. If you need to replace the battery in your laptop computer, follow these basic steps:

1. If the computer is connected to a docking device, undock it.
2. Ensure that the computer is turned off.
3. Slide the battery-bay latch release(s) on the bottom of the computer, and slide the battery out of the bay.



4. Slide the new battery into the bay and until it clicks into place.

Checking the Battery Charge

You can check the battery charge on your computer using any one of the following methods:

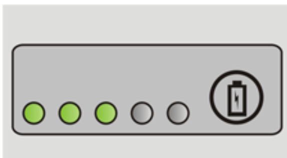
Microsoft Windows Power Meter

The Power Meter indicates the remaining battery charge. To check the amount of the power remaining on your battery, double-click the Power Meter icon in the taskbar.

Charge Gauge on the Battery

The operating time of a battery depends on the number of times it is charged. After hundreds of charge and discharge cycles, batteries lose some charge capacity—or battery health. That is, a battery can show a status of "charged" but maintain a reduced charge capacity, which is the health of the battery.

Charge Left on the Battery



To check the battery charge, press and release the status button on the battery charge gauge to illuminate the charge-level lights. Each light represents approximately 20 percent of the total battery charge.

> **EXAMPLE:** If the battery has 60 percent of its charge remaining, three of the lights are on. If no lights appear, the battery has no charge.

Checking the Health of the Battery

To check the battery health using the charge gauge, press and hold the status button on the battery charge gauge for at least 3 seconds.

If no lights appear, the battery is in good condition, and more than 80 percent of its original charge capacity remains. Each light represents incremental degradation.

If five lights appear, less than 60 percent of the charge capacity remains, and you should consider replacing the battery.

Understanding Low Battery Warnings

NOTICE: To avoid losing or corrupting data, save your work immediately after a low-battery warning. Then connect the computer to an electrical outlet, or install a second battery in the media bay if your laptop has this option. If the battery runs completely out of power, hibernate mode begins automatically.

Your laptop computer will display a warning when the battery charge is approximately 90 percent depleted. If you are using two batteries, the warning applies to the combined charge of both batteries. The computer enters hibernate mode when the battery charge is at a critically low level.

FOR MORE INFORMATION: To learn more about changing the settings for the battery alarms through the power management options in Windows, see Windows Help and Support: click **Start** or → **Help and Support**. Also, see "Setting Power Options" on page 135.

You can change the settings for the battery alarms through the power management options in Windows (see "Setting Power Options" on page 135).

Conserving Battery Power

To conserve battery power on your laptop computer, do any of the following:

- Connect the computer to an electrical outlet when possible; battery life is largely determined by the number of times the battery is used and recharged.
- Configure the power management settings using Microsoft Windows Power Options to optimize your computer's power usage (see "Setting Power Options" on page 135).
- Use the Sleep power state when you leave the computer unattended for long periods of time.

Charging the Battery

When you connect the computer to an electrical outlet or install a battery while the computer is connected to an electrical outlet, the computer checks the battery charge and temperature. If necessary, the AC adapter then charges the battery and maintains the battery charge.

NOTE: With Dell™ ExpressCharge™, when the computer is turned off, the AC adapter charges a completely discharged battery to 80 percent in about 1 hour and to 100 percent in approximately 2 hours. Charge time is longer with the computer turned on. You can leave the battery in the computer for as long as you like. The battery's internal circuitry prevents the battery from overcharging.

If the battery is hot from being used in your computer or being in a hot environment, the battery may not charge when you connect the computer to an electrical outlet.

The battery is too hot to start charging if the light flashes alternately green and orange (light colors may vary depending on your battery). Disconnect the computer from the electrical outlet and allow the computer and the battery to cool to room temperature. Then connect the computer to an electrical outlet to continue charging the battery.

NOTE: You can operate your computer while the battery is charging. However, do not operate your computer using battery power until the battery is fully charged.

Storing a Battery

Remove the battery when you store your computer for an extended period of time. A battery discharges during prolonged storage. After a long storage period, recharge the battery fully before you use it.

US Department of Transportation (DOT) Notebook Battery Restrictions

As of January 1, 2008, the US DOT prohibits spare (loose) lithium batteries in checked baggage. A Dell notebook battery may be packed in a checked bag if the battery is installed in a Dell notebook and the notebook is switched Off.

HINT: To disable battery charging, you can use the Battery Charge Disable feature in Dell ControlPoint. This is useful, for example on airplanes, where charging of batteries may not be allowed.

Dell™ ControlPoint Power Manager

You can access the Dell ControlPoint Power Manager for your laptop computer from the Dell ControlPoint (DCP) application. The Dell ControlPoint icon appears on the taskbar. Click the icon to access Dell ControlPoint Help and additional features and options.

You can optimize the battery life for your laptop computer using the options available under All Day Battery mode or Extended Battery Life mode.

FOR MORE INFORMATION: To learn more about using the Dell ControlPoint application, see the *Help* available from the main ControlPoint screen.

12

Networks (LAN, Wireless, Mobile Broadband)



LAN



WLAN

Overview

A computer network provides connectivity between your computer and the Internet, another computer, or a peripheral such as a printer. For example, with a network set up in a home or small office, you can:

- Print to a shared printer.
- Access drives and files on another computer.
- Share files.
- Browse other networks.
- Access the Internet.

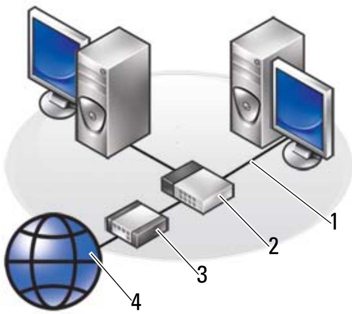
You can set up a local area network (LAN) using a broadband modem and network cables, or you can set up a wireless LAN (WLAN) using a wireless router or access point.

A Network Connections Wizard guides you through the process of setting up a computer network and connecting to other networks.

The Intel® Active Management Technology (Intel AMT or iAMT®) provides enhanced tools for management of networked computers. This Intel AMT software is available on some Dell computers. See "Managing Networked Computers With Intel® Active Management Technology" on page 168.

FOR MORE INFORMATION: To learn more about networks, see Windows Help and Support: click **Start** or → **Help and Support**.

Local Area Networks (LAN)



1	Cable	2	Router
3	Modem	4	Internet

A local area network (LAN) connects two or more computers with each other through a network cable connected to each computer. This type of computer network generally covers a small area. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

What You Need to Set up a LAN

- Cable or DSL broadband modem with Internet access established. For information on broadband connection, see "Broadband Access" on page 151.
- Router — A router connects computers and peripherals on the network to each other, allowing the computers to share Internet access provided by the broadband modem. A router has multiple ports, each supporting one computer or one peripheral such as a printer.
- Network cables — Use either CAT 5 or CAT 5e cables.
- Network interface card

Broadband Access

Broadband access provides much faster data transfer rates than dial-up access. Broadband access is particularly suited to e-mailing large digital photographs, downloading music, or viewing streaming videos.

What you Need for Broadband Access

- You can choose between two specific types of broadband access offered by ISPs—*cable* and *DSL*. DSL broadband access is marketed by telephone companies, but it is not available at all locations. If you have cable television access, you can obtain cable broadband access through your cable provider.
- You must connect your computer or computer network to a cable modem or DSL modem for broadband access. You can purchase your own broadband modem or use the ISP's modem for a monthly equipment fee added to your monthly service charge.
- Your computer must have a network interface card.
- Your existing phone line or cable television line is used to provide the broadband service; a new line is not required.

Setting up a new LAN

The following steps are general guidelines for setting up a typical LAN. See the documentation provided with your router for specific details.

Setting up the Hardware

1 Contact your Internet service provider (ISP) to obtain specific information about the connection requirements for your broadband modem.

2 Ensure that you have Internet access through your broadband modem.

3 Install any software required for your router. Your router may have been shipped with installation media, which usually contains installation and troubleshooting information. Install the required software according to the instructions provided by the router manufacturer.

Connecting to the Network

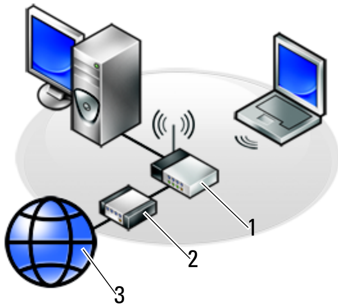
From your computer's **Control Panel**, click **Network and Internet connections**→ **Network and Sharing Center**.

The Network Connection Wizard may start automatically, or you may have to click an option for setting up a connection or network.

Actual steps may vary based on the operating system installed in your computer. Follow the instructions on the screen.

> **FOR MORE INFORMATION:** To learn more about connecting your computer to a network, see Windows Help and Support: click **Start** or → **Help and Support**.

Wireless Local Area Networks (WLAN)



1 Router **2** Modem **3** Internet

A wireless local area network (WLAN) connects two or more computers with each other and the Internet over the air waves rather than through a network cable connected to each computer.

In a WLAN, a radio communications device (an access point or wireless router) connects the networked computers and peripherals, and provides Internet or network access. The access point or wireless router and the wireless network card in the computer communicate by broadcasting data from their antennas over the air waves.

> **FOR MORE INFORMATION:** To learn more about WWAN, see Windows Help and Support: click **Start** or → **Help and Support**. Also, see any device guides for the wireless cards that may have come with your computer.

What you Need to set up a WLAN

- Broadband Internet access (such as cable or DSL)
- A broadband modem
- A wireless router

- A wireless network card, an integrated wireless adapter, or a wireless USB adapter for each computer that you want to connect to your WLAN

  See "Checking Your Wireless Network Card" on page 154.
- A network cable with network (RJ-45) connectors

Checking Your Wireless Network Card

To confirm that your computer has a wireless network card and to determine the type of card, check the order confirmation that you received when you ordered your computer, or use the Device Manager (see "Device Manager" on page 26):

Windows Vista

1. Click **Start** , right-click **Computer** and select **Properties**.
2. Under **Tasks** click **Device Manager**.
3. Click **Network Adapters**.

Windows XP

1. Click **Start** , right-click **My Computer** and select **Properties**.
2. Click the **Hardware** tab.
3. Click **Device Manager**→ **Network Adapters**.

Reinstalling Software and Drivers for Your Wireless Network Card

If the software is removed or corrupted, follow the instructions in the user documentation for your wireless network card.

Verify the type of wireless network card installed in your computer and then search for that name on the Dell Support website at **support.dell.com**.

FOR MORE INFORMATION: To learn more about how to determine the type of wireless network card that is installed in your computer, see "Checking Your Wireless Network Card" on page 154.

Setting up a new Wireless Local Area Network (WLAN)

1 Contact your Internet service provider (ISP) to obtain specific information about the connection requirements for your broadband modem.

2 Ensure that you have wired Internet access through your broadband modem before you attempt to set up a wireless Internet connection.

3 Install any software required for your wireless router. Your wireless router may have been shipped with installation media, which usually contains installation and troubleshooting information. Install the required software according to the instructions provided by the router manufacturer.

Connecting to a WLAN

NOTE: The following networking instructions do not apply to internal cards with Bluetooth® wireless technology or cellular products.

This section provides general procedures for connecting to a network using wireless technology. Specific network names and configuration details vary.

FOR MORE INFORMATION: To Learn more about connecting your computer to a WLAN, see the device guides that came with your computer or look for related topics in Windows Help and Support: click **Start** or → **Help and Support.**

Windows Vista®

1 Click **Start** → **Network**.

2 Click **Network and Sharing Center** on the navigation bar at the top of the **Network** folder.

3 Click **Connect to a network** under **Tasks**.

4 Select the desired network from the list and click **Connect**.

Windows® XP

1 Click **Start** → **Control Panel**→ **Network and Internet Connections**→ **Network Connections.**

2 Click **Wireless Network Connection**→ **View Wireless Networks**.

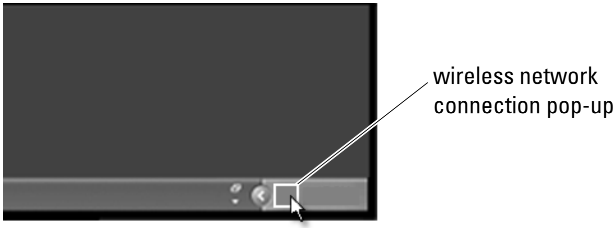
3 Select the desired network from the list and click **Connect**.

NOTE: Your available selections may differ based on any configuration or changes your may have made to your Start menu.

NOTE: If you select a secure public network, you must enter the network's WEP or WPA encryption key when prompted.

Whenever you log on to your computer within the range of the wireless network that you selected, the same pop-up notifies you of the wireless network connection.

NOTE: Your computer can take several minutes to connect to the network.



Connecting to a Secured Wireless Network (Using WEP or WPA Keys)

If you select a secure network, you must enter the network's WEP or WPA key when prompted. This value is unique to your network and is established when the wireless router is configured. You may be able to obtain this information from your network administrator.

Connecting to a Public WLAN (Hotspot)

If you want to connect to a public wireless network, follow the procedure described in "Connecting to a WLAN" on page 155. Add this network to your lists of available networks and enter any encryption keys if the network is a secured network.

Some computers may even display a pop-up indicating that a public WLAN is within range of your computer.

HINT: Follow the instructions for connecting to a public wireless network one time, and whenever you come into range of the same wireless network, your computer will detect it and connect to it.

Enabling/Disabling the Wireless Card With a Wireless Switch

Your laptop computer may include a wireless switch. You can use this switch to turn your wireless card on or off.

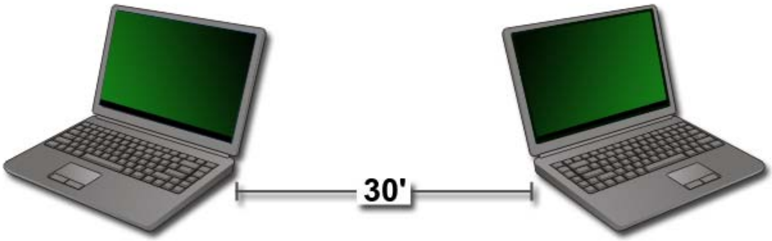
NOTE: By default, the wireless switch is turned Off while shipping your computer. The wireless switch must be turned On to detect and connect to a wireless network.

On some computers, you can also use the wireless switch to scan for a wireless network by sliding and holding the wireless switch in position for a few seconds. Other computers may use a separate button or switch for scanning.



FOR MORE INFORMATION: To learn more about how to find out if your computer has a wireless switch and where it is located, see your computer's documentation.

Ad Hoc Networks



Ad hoc networks are simple networks that connect two or more computers in close range without the use of a router or access point. Generally ad hoc networks are used for sharing files and playing games. Some of the Dell wireless printers use an ad hoc network to configure the wireless adapter for the printer.

The Windows Vista operating system provides an easy-to-use wizard to help you set up the network.

1 From the Network and Sharing Center, click **Tasks**→ **Setup a connection or network**.

2 Click **Set up a wireless ad hoc (computer-to-computer) network**→ **Next**.

   The **Set up a wireless ad hoc network information** screen appears. This screen explains what an ad hoc network is and tells you that your computer must be within 30 feet of the other computers you are connecting to.

3 Click **Next** to begin.

4 Follow the instructions on the screen.

HINT: The ad hoc network does not become active until at least one other computer joins the ad hoc network.

Mobile Broadband (or Wireless Wide Area Network) Networks



A Mobile Broadband network, also known as a Wireless Wide Area Network (WWAN), is a high-speed digital cellular network that provides Internet access over a much wider geographical area than a WLAN, which typically covers only from 100 to 1000 feet.

Your computer can maintain Mobile Broadband network access as long as the computer is within a cellular-data coverage zone. Contact your service provider for coverage details.

NOTE: Even if you are able to make a call from your cellular phone in a specific geographical location, that location may not necessarily be within a cellular-data coverage zone.

FOR MORE INFORMATION: To learn more about Mobile Broadband networks (Wireless Wide Area Networks), see the following resources:

- Windows Help and Support: click **Start** or → **Help and Support**
- Any device guides for the Mobile Broadband cards that may have come with your computer
- Any device guides that may have come on the media that accompanied your card if you purchased it separately.

Establishing a Mobile Broadband Network Connection

NOTE: Depending on your computer, you can use either a Mobile Broadband ExpressCard or Mini Card, but not both, to establish a Mobile Broadband network connection.

To set up a Mobile Broadband network connection, you need:

- A Mobile Broadband ExpressCard or Mini Card (depending on your computer's configuration)
- An activated Mobile Broadband ExpressCard or activated Subscriber Identity Module (SIM) from your service provider
- The Mobile Broadband Card Utility (already installed in your computer if you purchased the card when you purchased your computer, or on the media that accompanied your card if purchased separately from your computer)

  If the utility is corrupted or deleted from your computer, see the Mobile Broadband Card Utility user's guide in Windows Help and Support (click **Start** or → **Help and Support**) or the media that accompanied your card, if you purchased it separately.

Checking Your Mobile Broadband Card

1. Click **Start** or → **Help and Support**.
2. Search for **Computer Information**, Use **Tools,** or **System Information** to view your computer information and diagnose problems.

HINT: The Mobile Broadband card is typically listed under **Modems** on Windows Help and Support.

Connecting to a Mobile Broadband Network

NOTE: These instructions only apply to Mobile Broadband ExpressCards or Mini Cards. They do not apply to internal cards with wireless technology.

Activating Mobile Broadband Service

Before you connect to the Internet, you must activate Mobile Broadband service through your cellular service provider.

FOR MORE INFORMATION: To learn more about using the Dell Mobile Broadband Card Utility, see:

- The user's guide typically available through Windows Help and Support: click **Start** or → **Help and Support**
- The user's guide available on the Dell Support website at **support.dell.com**
- The user’s guide available on the media included with your Mobile Broadband card if you purchased the card separately from your computer

Managing the Network With the Dell Mobile Broadband Card Utility

1. Click the Dell Mobile Broadband Card Utility icon in the Windows notification area to run the utility.
2. Click **Connect**.
3. Follow the instructions on the screen to manage the network connection with the utility.

HINT: Dell offers an easy method for getting started with Mobile Broadband. Click **Start** → **All Programs**→ **Dell Wireless**→ **Dell Wireless Broadband** and follow the instructions on the screen.

WiMAX

NOTE: WiMAX is not supported on all computers.

WiMAX (Worldwide Interoperability for Microwave Access) is a standards-based telecommunications technology that provides wireless data.

WiMAX enables delivery of last mile wireless broadband access as an alternative to wired broadband like cable and DSL. It is based on the IEEE 802.16 standard, which is also called WirelessMAN and provides fixed and laptop connectivity without the need for direct line-of-sight with a base station. Mobile wireless broadband support is expected in the near future.

WPAN

NOTE: WPAN is not supported on all computers.

WPAN (Wireless Personal Area Network) helps interconnect wireless devices centered around your personal workspace.

WPAN technology supports communication over a short distance. Bluetooth, used as the basis for a new standard, IEEE 802.15. is an example of WPAN.

Managing Your Network

Securing Your Network

To protect your network and computer from intrusions, install some of the internet countermeasures that are available to help protect your network from hackers, spyware, and invasion of your privacy.

Secure your router.	If your network's router is unprotected, a hacker can access your computer through your broadband Internet connection. To improve the security of your network, change the network name and administrator password to unique values using the router configuration software, and change the administrator password periodically. When setting up the router, enable data encryption. To set up data encryption on the router, use your router's configuration software.
Set up a firewall.	A firewall helps protect computers within the network from unauthorized access from outside the network. Some firewalls also restrict unauthorized transmittal of information from within the network, as in the case of spyware software sending information through the Internet to an unauthorized party. The Windows Vista and Windows XP operating systems incorporate a firewall. Follow these steps to check that the Windows firewall is enabled: 1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**. 2 Select the **Windows Firewall** icon. 3 If the **Firewall** option is disabled, select this option to enable the firewall.
Use up-to-date software.	Software companies regularly update their products to add security fixes. Install the latest version of your Internet browser and operating systems on all computers on your network, and check for updates regularly.

Securing Your Wireless Local Area Network (WLAN)

Change the Default Router Administrator Password Setting and Default Wireless Network Name (SSID).	Your wireless router uses an administrator password and wireless network name (Service Set Identifier [SSID]), which are set to default values by the router manufacturer. To improve the security of your wireless network, change the network name and administrator password to unique values using the router configuration software, and change the administrator password periodically.
Set up encryption.	When setting up your wireless router, enable data encryption. The most common types of encryption standards include: • Wired Equivalency Privacy (WEP) • Wireless Protected Access (WPA) • Wireless Protected Access 2 (WPA2) WPA and WPA2 encryption are more secure than a password-based system because the encryption key changes dynamically. All hardware on your network must support the same encryption standard. To set up data encryption on the router, use your router's configuration software.

Set up MAC filtering.	If you configure your wireless router to use MAC filtering, the router will limit access to wireless adapters with MAC addresses that you specify. **1** Open the **Command Prompt** window and type `ipconfig/all.` **2** Under the wireless network connection, note the 12-character hexadecimal **Physical Address** value. This value is the MAC address for the computer's wireless adapter. **3** Repeat step 1 and step 2 on each computer in your network to obtain the MAC address of each computer's wireless adapter. **4** Run the wireless router's configuration program and enable the MAC filtering option. (This option may also be designated as "Access Control" or a similar term.) **5** Enter the MAC addresses you obtained in step 2 and step 3.

When you set up the wireless network, specify the same encryption type and encryption key on each wireless device in your network.

Ensuring Security When Using Public Wi-Fi Networks (Hotspots)

Before connecting your computer to a public wireless network, you should configure your computer's network settings to reduce security risks.

Update your software.	Before using public wireless networks, update your operating system and security software with the latest security patches and virus information.
Use a firewall.	If you are using the Windows Vista or Windows XP operating system, ensure that the Windows firewall feature is enabled. See "Using a Firewall to Secure Your Computer" on page 255. If your operating system does not include a firewall, purchase and install an integrated Internet security software package or, at a minimum, standalone firewall software.
Disable file and print sharing.	Disable file and print sharing before using a public Wi-Fi network connection: 1 Click **Start** → **Control Panel**. 2 Double click the **Security Center** icon, then click the **Windows Firewall** option. 3 Select the **Exceptions** tab on the **Windows Firewall Settings** dialog box. 4 Uncheck **File and Printer Sharing** and then click **OK**.
Configure your Windows network security settings for a Public Place.	When you first connect to a wireless network, your computer requires you to specify the type of network, and then configures the firewall settings accordingly. For a public, non-secure network, you should select the **Public Place** option.
Subscribe to a Virtual Private Network (VPN) or secure hotspot wireless service provider.	If you use public wireless access frequently, subscribe to a Virtual Private Network (VPN) service or secure hotspot wireless service.
Do not access online financial websites from a public WLAN.	Even if you follow the preceding guidelines, do not access online banking or brokerage websites when using a public WLAN.

Locating Networks With the Dell Wi-Fi Catcher™ Network Locator

Your computer may include a wireless switch. To find out if your computer has a wireless switch and where it is located, refer to the "About Your Computer" section of your documentation.

The wireless switch uses the Dell Wi-Fi Catcher Network Locator to scan specifically for wireless networks in your vicinity.

Scanning for a Wireless Network

On some computers, you can use the wireless switch to scan for wireless networks in your vicinity. To scan for a wireless network, slide and hold the wireless switch in position for a few seconds (see "Enabling/Disabling the Wireless Card With a Wireless Switch" on page 157).

Other computers may use a separate button or switch for scanning. Follow the instructions in the documentation for using the wireless switch or button.

The Wi-Fi Catcher Network Locator functions regardless of whether your computer is turned on or off, or in a sleep mode, as long as the switch is enabled and configured to control Wi-Fi network connections.

NOTE: The light turns on only when the computer is turned off.

Enabling the Network Locator

Because the Wi-Fi Catcher Network Locator may be disabled and not configured for use when your computer is shipped to you, you must first enable and configure the switch to control Wi-Fi network connections. You can accomplish this task through:

- Dell ControlPoint Connection Manager
- System BIOS, available through the system setup program (see "System Setup" on page 307)

Dell ControlPoint Connection Manager

You can access the Dell ControlPoint Connection Manager from the Dell ControlPoint (DCP) application.



Dell ControlPoint Connection Manager is a network connectivity application that enables you to manage all networking from a single place on your computer. You can use the ControlPoint Connection Manager to manage network types, such as:

- Wi-Fi
- Mobile Broadband
- Dial-up
- Ethernet (or "wired")
- Bluetooth and UWB
- GPS

To access the ControlPoint Connection Manager to enable and configure your computer's Wi-Fi Network Locator feature:

1 Click the ControlPoint icon (DCP icon) on the taskbar. The **Dell ControlPoint** window is displayed.

2 Click **Connection Manager**. The **Connection Manager Overview** window appears.

3 From the Connection Manager Overview window, select **Manage Connections** and follow the instructions.

For help, click the Connection Manager help**?** (question mark).

FOR MORE INFORMATION: To learn more about using the Dell ControlPoint application, see the help available from the main ControlPoint screen.

Managing Networked Computers With Intel® Active Management Technology

For some systems, Dell uses the Intel® Active Management Technology (Intel AMT, or iAMT®) to allow network administrators to manage networked computers. With this technology, administrators can:

- Discover and manage computing assets on a network regardless of whether the computer is turned on or off.

- Remotely repair systems even after operating system failures — In the event of a software or operating system failure, Intel AMT can be used to access the computer remotely for repair purposes.
- Protect networks from incoming threats while keeping software and virus protection up to date across the network

See the Dell™ *Systems Management Administrator's Guide* for details on the use of the Intel® Active Management Technology. This guide is available on the Dell Support website at **support.dell.com**.

13

Accessing the Internet



Overview

The Internet is an electronic communications network that connects computer networks (for both individual and organizational users) around the world. The Internet supports an extensive world-wide collection of computers and servers, which contain documents or information pages (called web pages) that link to one another through a process called *hypertext linking*, or *hyperlinks*.

These electronic documents that are stored on computers around the world and are accessible via the Internet make up the Web (World Wide Web).

What you Need to Connect to the Internet

NOTE: ISPs and ISP offerings vary by country.

To connect to the Internet, you need a modem or network connection and an Internet Service Provider (ISP). An ISP offers one or more of the following Internet connection options:

- DSL (Digital Subscriber Line) connections that provide high-speed Internet access through your existing telephone line. With a DSL connection, you can access the Internet and use your telephone on the same line simultaneously.
- Cable modem connections that provide high-speed Internet access through your local cable TV line.
- Satellite modem connections that provide high-speed Internet access through a satellite television system.
- Dial-up connections that provide Internet access through a telephone line. Dial-up connections are considerably slower than DSL, cable, and satellite modem connections.
- Wireless Wide Area Network (WWAN) or Mobile Broadband technology provides a connection to the Internet using cellular technology at broadband rates.
- Wireless Local Area Network (WLAN) connections use high-frequency radio waves to communicate. Typically, a wireless router is connected to the broadband cable or DSL modem that broadcasts the Internet signal to your computer.

If you are using a dial-up connection, connect a telephone line to the modem connector on your computer and to the telephone wall jack before you set up your Internet connection.

If you are using a DSL, cable, or satellite modem connection, contact your ISP or cellular telephone service for setup instructions.

Web Browsers for Viewing Internet Sites

To view the Internet, you need a web browser, which is a software application (a program) that displays web pages. Web pages include text, graphics, sound, and video, which use the hypertext markup language (html). Web pages have links that allow you to move from one document to another, even when the documents are stored in different locations on the Internet.

A website is a collection of web pages maintained by an individual or an organization.

Web browsers allow you to read the hyperlinked web pages. Several web browsers are available. A commonly used browser is Internet Explorer.

1 To view a particular website, open Internet Explorer by clicking the Internet Explorer icon.

2 When the browser opens, click the address bar at the top of the browser window, and type in a web address.

Web Addresses

A web address, or uniform resource locator (URL), provides the location of a website. Every web page on the Internet has a URL. A common format for a web address is: **http://www.dell.com.**

> **FOR MORE INFORMATION:** To learn more about the Internet and the different types of Internet connections, search for information on the Dell Support website at **support.dell.com.**

Setting up Your Internet Connection

To connect to the Internet, you need a modem or network connection and an Internet Service provider (ISP).

To set up an Internet connection with a provided ISP desktop shortcut:

1 Save and close any open files, and exit any open programs.

2 Double-click the ISP icon on the Microsoft® Windows® desktop.

3 Follow the instructions on the screen to complete the setup.

NOTE: Have your ISP information ready. If you do not have an ISP, the Connect to the Internet wizard can help you obtain one.

If you do not have an ISP icon on your desktop or if you want to set up an Internet connection with a different ISP:

Windows Vista®

1 Save and close any open files, and exit any open programs.

2 Click **Start** → **Control Panel**→ **Network and Internet**.

3 Under **Network and Sharing Center**, click **Connect to the Internet**.

The **Connect to the Internet** window appears.

4 Click either **Broadband (PPPoE)**, **Wireless**, or **Dial-up**, depending on how you want to connect:

- Choose **Broadband** if you will use a DSL modem, cable TV modem, or satellite modem.
- Choose **Wireless** if you will use a wireless connection through a WLAN card.
- Choose **Dial-up** if you will use a dial-up modem or ISDN (Integrated Services Digital Network).

NOTE: If you do not know which type of connection to select, click **Help me choose** or contact your ISP.

5 Follow the instructions on the screen and use the setup information provided by your ISP to complete the setup.

Windows® XP

1 Save and close any open files, and exit any open programs.

2 Click **Start** → **Control Panel**→ **Network and Internet Connections**.

3 Click **Set up or change your Internet connection**.

4 Click **Setup**. **New Connection Wizard** window appears.

5 Click **Next**. Choose **Connect to the Internet** and click **Next**.

6 Click **Set up my connection manually** and click **Next**.

7 Click either **Broadband (PPPoE)**, **Wireless**, or **Dial-up**, depending on how you want to connect.

- Choose **Broadband** if you will use a DSL modem, cable TV modem, or satellite modem.
- Choose **Wireless** if you will use a wireless connection through a WLAN card.
- Choose **Dial-up** if you will use a dial-up modem or ISDN (Integrated Services Digital Network).

NOTE: If you do not know which type of connection to select, click **Help me choose** or contact your ISP.

8 Follow the instructions on the screen and use the setup information provided by your ISP to complete the setup.

Troubleshooting Problems Connecting to the Internet

If you are having problems connecting to the Internet, see the information that came from your Internet service provider and the information that came with any connection hardware.

If you cannot connect to the Internet, but have successfully connected in the past, the ISP may have a service outage. Contact your ISP to check the service status, or try connecting again later.

Web Browser Settings

By altering the browser settings you can adjust the web browser for convenience and security. For example, to change settings for Internet Explorer:

- Open Internet Explorer and click **Tools**→ **Internet Options**.

  OR

- Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.

The **Internet Options** window appears. Use this window to establish settings for certain features, such as:

- Browser home page
- Web page appearance
- Browser history
- Accessibility options

Setting the Browser Home Page

Set a browser home page (most frequently used page), so that every time Internet Explorer is opened, the same page appears.

1. Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.
2. Type the web address of the site you would like opened first every time you use Internet Explorer.

Setting the Way the Browser Displays Web Pages

The general appearance of a web page can be altered through the use of colors, languages, font, and accessibility.

1 Click **Start→ Control Panel→ Network and Internet Connections→ Internet Options**.

2 Locate buttons to control web page appearance. Click the buttons for the features you wish to change.

Colors	From the color selection window you can alter the text, the background, and the hyperlinks. The default is a simple Windows color scheme, black text, white background, and blue hyperlinks (purple if they have already been visited). 1 Uncheck the **Use Windows Colors** default check box and the fields will no longer be greyed out. 2 Click on the text color palette and a box of colors becomes available. 3 Click **OK**. **NOTE:** Changing the text and the background colors to two similar colors makes text very difficult to read. **NOTE:** Some web pages have predefined color schemes that override your preferences.
Languages	Language can be selected to display certain characters in the preferred language.
Font	Fonts describe the size, shape, and style of the text. Select the font that you prefer.
Text size	Increase or decrease text size by: Press <Alt><v>. Click **Text Size** and a side menu allows for immediate adjustment from largest to smallest. If you have adjusted the text to the largest font size possible, and are still having trouble reading the text on a web page, try the **Zoom** feature at the bottom right-hand side of the window.

Zoom	Adjust the size of everything on the screen by using the Zoom feature. Hold the <Ctrl> key down while pressing the plus (+) key to zoom in. Hold the <Ctrl> key down while pressing the minus (–) key to zoom out.

Saving Space by Setting the way the Browser Logs Viewing History

Internet Explorer keeps a log of the websites that you visit in order to speed up the process of downloading graphics each time you re-visit a web page. You can delete or decrease the amount of space the history logs use.

1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.

2 Delete the files in the browsing history by clicking **Delete**, or minimize the amount of space by clicking **Settings**.

3 Reduce the file size (the number of MBs in memory) and/or reduce the number of days to keep information in the browsing history to limit the space used to store this information.

Increasing Computer Speed by Limiting the Number of Open Internet Windows

Tabs allow you to open multiple web pages at the same time in the same browsing window. It is not necessary to have multiple instances of Internet Explorer running simultaneously.

The tab feature speeds computer processing by limiting the number of programs that are open.

1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.

2 In the **Tabs** section, click **Settings**.

3 Click to select the check box next to **Enable Tabbed Browsing**.

4 Click to select **Enable Quick Tabs** check box. This option provides a visual display of all the tabs that are open.

5 Click **Always open pop-ups in a new tab**.
   This action ensures that advertisements open in the web browser you are currently using without redirecting your to a new address.
6 In the **Open links from other programs** section, click **A new tab in the current window**. This action opens hyperlinks in a new tab without opening a new browser.

Using Accessibility Options for Visual Impairments

If you have a visual impairment, the accessibility menu can be used to override individual web page settings to ignore certain colors and fonts on specified web pages.

Click on any of the radio buttons to enable the accessibility features, or use the more advanced style-sheet feature, which allows a pre-formatted style sheet to be used for all web pages.

Internet Security and Privacy

Increasing Security for Your Computer While Accessing the Internet

Your Internet security can be increased, but you lose the ability to see all the functions that are available. However, if you lower the Internet security settings to see everything, you risk the security of your computer.

1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.
2 Open the **Security** tab.
3 While the Internet icon is highlighted, use the vertical slide bar in the security level for this zone to increase or decrease the security for Internet websites.

Clicking any of the other icons on the **Security** page will open additional security options.

1 Click **Sites** under either of these headings and add the sites that you trust or want to restrict.
   - Trusted sites can be added to a list so that information from those sites will be considered secure.

- Restricted sites allow you to add websites that you fear may damage your computer.

2 Type in the web address of the site and click **OK**.

Protecting Your Privacy While Accessing the Internet

Privacy affects how other web pages are able to impact your computer. Each time you visit a website a certain amount of interaction occurs between the web page and your computer's browser.

Sometimes websites display ads that pop up in another window. Sometimes your visits to a website are tracked by cookies that are placed on your computer.

Ensure security and privacy by:

Using antivirus and antispyware protection programs	See "Using Antivirus Programs" on page 180 and "Preventing Spyware and Malware Infection" on page 182.
Installing firewalls	See "Firewalls" on page 180.
Avoiding spam and phishing scams	See "Spam" on page 183 and "Phishing Scams" on page 183.
Controlling pop-ups and cookies	See "Controlling Pop-ups" on page 184 and "Maintaining Privacy by Blocking and Deleting Cookies" on page 189.
Using secure shopping techniques	See "Shopping Securely Over the Internet" on page 183.

Viruses

Viruses are programs that attack your computer, damaging data and system programs and compromising secure information. These viruses can attach themselves to files that you download or receive in e-mail attachments.

Using Antivirus Programs

Protect your computer from viruses by using antivirus programs. Two popular antivirus programs include Norton AntiVirus and McAfee VirusScan. Both of these programs will regularly check your computer for viruses and quarantine suspected programs and data.

You can obtain antivirus programs from the Dell Support web page located at **support.dell.com**.

Updating Your Antivirus Programs

Keep your antivirus program up to date since new viruses are discovered every day. Regularly check for updates to your antivirus program. Some antivirus programs can update automatically when you are connected to the Internet.

Firewalls



Firewalls are an added security feature in Windows operating systems. A firewall is a software device that is configured to allow data to pass through a computer network, which has different levels of trust.

The basic task of a firewall is to regulate the flow of traffic between computer networks of different trust levels.

> **EXAMPLE:** Typical examples of computer networks are:
>
> - Internet, which is a zone with no trust
> - Internal networks, which are zones of higher trust type

To set up a firewall:

1. Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Windows Firewall**.
   OR
   Click **Start**→ **Control Panel**→ **Security Center**→ **Windows Firewall**.
2. Click **Change Settings**. **Windows Firewall Setting**s window appears.

The **General** tab displays two settings: **On** and **Off**. The shields to the left are *green with a checkmark* (**On**) or *red with an x* (**Off**).

Setting Windows Firewall to **On** (recommended) provides another choice. A check box that says **Don't allow exceptions** is available for use.

3 Check the **Don't allow exceptions** check box to boost the security settings. Windows Firewall will send a message every time it blocks a program.

The **Windows Firewall** window provides several tabs that allow you to customize your security settings.

General tab	The **General** tab displays two settings: **On** and **Off**. Setting Windows Firewall to **On** (recommended) provides an additional choice of **Don't allow exceptions**.
Exceptions tab	The **Exceptions** tab allows certain program types to operate without Windows Firewall interfering or sending a message that a program was blocked.
Advanced tab	The **Advanced** tab allows more specific settings. • The **Network Connection Settings** tab provides the option for Windows Firewall to be applied to any or all the connection types available. • **Security Logging** settings can be enabled to keep a log of all the dropped packets as well as all the successful connections in a designated file. • The **Internet Control Message Protocol** (ICMP) settings allow computers on a network to share error and status information with one another. • The **Default Settings** allow for a complete Windows Firewall restore. This option places the firewall at the default status.

HINT: You must be logged on to the computer as an administrator to turn on Windows Firewall.

Spyware and Malware

Spyware is a type of computer program used for tracking consumers to better aim advertising at specific targets. It can also be used to discover information about individuals who do not protect their computers.

Malware is software that is designed to corrupt data or hard drives on computers. Some malware can record every key you press, which may allow the capture of your credit card numbers and banking information.

Spyware and malware can potentially harm your computer and make the information it contains vulnerable to security risks.

Several indicators point to infection with spyware. Watch for:

- Computer performance slows
- Regular tasks take longer to complete
- Your Web browser home page changes
- Pop-ups appear even when you are not connected to the Internet

Preventing Spyware and Malware Infection

Several options are available to prevent spyware and malware from infecting your computer. For example, you can use anti-spyware programs to secure, check, and/or clean up your computer. Remember to ensure that your anti-spyware program is always up to date.

HINT: Use trusted websites when downloading files. Be careful when obtaining free files on the Internet.

FOR MORE INFORMATION: To learn more about compatible anti-spyware and anti-malware software programs for Windows Vista, visit the Microsoft Catalog at the Microsoft website (**microsoft.com**).

FOR MORE INFORMATION: To learn more about spyware and malware, see the following topics in Windows Help and Support: click **Start** or → **Help and Support**:

- "Remove spyware from your computer"
- "Using anti-malware software to help protect your computer"
- "When to trust a website".

Spam

Spam refers to unwanted e-mail messages, which can include chain letters and advertisements. You can obtain anti-spam programs to reduce the amount of spam you receive. However, these programs are not perfect and may block valid e-mail messages.

Obtain anti-spam programs from the Dell web page.

Phishing Scams

Phishing is a term that refers to scams that attempt to steal information through seemingly legitimate e-mails and text messages that appear to be from a reputable business. Be cautious with any e-mail or website that requests your personal information, such as your credit card number.

Protect yourself from phishers by turning on the Phishing Filter.

NOTE: You must have Internet Explorer version 7 to use this filter.

1. Open Internet Explorer and click **Tools**→ **Phishing Filter**.
2. Click to select **Turn on the Automatic Website Check**.
3. Click **Phishing Filter Settings**. The filter redirects you to the Internet Options **Advanced** tab to make more selective settings.

Shopping Securely Over the Internet

It is important to do business with reputable online stores to avoid possible fraud and to easily exchange or return items. Read store ratings or reviews by other customers if you are not familiar with the online store.

Take the following precautions to ensure that your online shopping experience is both safe and secure:

- Verify the credibility of the retail website.
- Is it a well known shopping site?
- Does the website belong to an Internet trust organization.
- Can you contact a person associated with the website by phone or a physical mailing address?
- Is product information and availability displayed openly and honestly?
- How fast will the order be processed?
- Are the shipping costs reasonable?
- Does the store have a reasonable return/exchange policy?
- Does the website use of encryption for user and payment data?
- Are there any quality seals on the website? These seals represent an outside assessment of the security measures in place.

Controlling Pop-ups

1 From the **Internet Options** window, click the **Privacy** tab.

2 If the box next to **Pop-up blocker** is unchecked, then the pop-up blocker is not turned on.

  If the box is checked, then the pop-up blocker is turned on, and you can click **Settings** to access more features for the pop-up blocker.

3 Click **Settings**.

4 Enter web addresses into the exception area to allow pop-ups from specified websites.

5 In the **Notifications and Filter level** section, place a checkmark in the two boxes if you would like to hear a sound when a pop-up is blocked, and if you want to see the information bar when a pop-up is blocked.

6 In the **Filter level** drop-down menu, chose **Low**, **Medium**, or **High** settings to control the amount of privacy.

Controlling Unwanted Toolbars



Toolbars are located in the top of the browser to assist you as you navigate through web pages. Many of these are useful but too many can decrease the actual size of the browser you use to view the websites.

1 Click **View**.
2 Click **Toolbars**. Another menu will appear that displays all the available toolbars for the browser. A check next to a toolbar indicates that the toolbar is currently turned on.
3 Click a toolbar to enable or disable it.

Content Advisory/Parental Controls

Internet Explorer has the ability to block content from the Internet.

1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.
2 Open the **Content** tab.
3 Click **Enable** in the **Content Advisory** portion of the tab.

Certain types of content can be blocked by requiring a password to access the website. Read the description under the option before selecting it.

Bookmarking Favorite Websites

Save the address of frequently visited websites for later reference by bookmarking them.

In Internet Explorer, use the **Favorites** menu to bookmark frequently visited websites. On the web page you want to add, click **Favorites**→ **Add to Favorites**.

To organize your list of favorite bookmarks into folders:

1 Click **Favorites**→ **Organize Favorites**.
2 Click **Create Folder** to create a new folder.
3 Highlight a folder or page and click **Rename** to change the way a favorite is listed.
4 Highlight a folder or page and click **Move to Folder** to move a page into a folder.
5 Highlight a folder or page and click **Delete** to delete a favorite from your list.

To view a list of favorites, click on the **Favorites** menu and a drop-down list appears with all of the previously chosen favorites. This function can also be accomplished by pressing the <Alt><a> key combination.

Searching for Information on the Internet

If you need to find information (a web page) on the Internet without actually knowing the web address, you can use a search engine to search for information.

There are many search engines to choose from. Each search engine may behave differently. Read the Help sections for the specific search engine to learn how to use it.

1 Access a common search engine and type the word or combination of words you are searching for in the **Search** field.
2 Press <Enter> or click **Go** or **Search** (depending on the search engine).

A list of related web pages is displayed below the search field.

HINT: When searching for information, make sure that your spelling is correct and that you use specifically related words to help refine the search. Most search engines have an advanced search feature to help refine your search.

Changing the Internet Communications Protocol (TCP/IP) Settings

The Internet uses certain communications protocols to share information. When you click a selected website (to access the web page), information is sent (downloaded) to your computer through a communications protocol, such as:

TCP/IP (Transmission Control Protocol (TCP) and Internet Protocol (IP).

You may need to change your computer's settings for the TCP/IP.

FOR MORE INFORMATION: To learn more about the settings for your TCP/IP, see the documentation that came from your Internet Service Provider. Also, see Windows Help and Support for a better understanding of working with Internet settings: click **Start** or → **Help and Support**.

Printing a Web Page

Many websites provide a printer-friendly version of the pages to be printed. If this is not available:

1 Click **File**.

2 Click **Print Preview** to view and verify what will be printed. Often the format of the page you are currently viewing is not what is printed.

Other features are available from the **Print Preview** screen:

- Click the first drop-down menu to allow multiple pages to be displayed simultaneously.
- Click the second drop-down menu to move from frame to frame. Since many windows are divided into separate sections (frames), sometimes the section that prints is located in a separate frame from the rest of the browser.
- Click the third drop-down menu to zoom in or out of a specified page.

Freeing up Space and Protecting Your Computer

Clearing Browser History

The browser keeps a record of all the websites you visit. This function was designed to make travel to the same website take less time. However, this can sometimes create security risks or even impact your computer's performance. Deleting the browser history can reduce the risk and the size of the history files on the computer.

1 Click **Start**→ **Control Panel**→ **Network and Internet Connections**→ **Internet Options**.
2 In the browser history section, click **Delete**.

Deleting Temporary Internet Files

As files are downloaded to your computer, they are stored in temporary file space. These files can become a drain on your computer's resources if too many are stored. Deleting them regularly helps enhance your computer's performance and speed.

1 Open your web browser and locate a tab for **Internet Options**.
2 From the **Temporary Internet Files** section, click the **Delete Files** button.

Decreasing the Size of the Temporary Files Folder

Internet Explorer keeps a log of the websites that you visit and a storage space of temporary Internet files. You can delete or decrease the amount of space the temporary files and history logs use.

1 From Internet Explorer, click the **Internet Options** tab.
2 Delete the files in the browsing history, and then minimize the amount of space by clicking **Settings**.
3 Reduce the number of MB in memory and/or reduce the number of days to keep information in the browsing history to limit the space used to store this information.

Maintaining Privacy by Blocking and Deleting Cookies

Cookies are small markers (pieces of code) placed on your computer when you visit a website. Companies on the Internet use cookies to track visits to their website.

Some cookies simply enhance your use of a website. For example, a cookie can save your website password information so that you only have to enter it the first time you visit a website. However, some cookies may use this personal information for commercial gain, putting your privacy at risk.

Delete the cookies in your web browser's history by opening your Internet browser and clicking the **Options** tab. Look for a **Delete Cookies** button and click it.

For example, to delete cookies in Internet Explorer:

1 Open Internet Explorer.

2 Click the **Tools** tab→ **Internet Options**.

3 Under the **Temporary Internet Files** section, click the **Delete Cookies** button.

You can also limit the number of cookies placed in your computer by increasing the privacy settings:

1 From the **Internet Options** window, click the **Privacy** tab.

2 Move the vertical slide bar *up* for more privacy and the reduction of cookies allowed, or *down* for less privacy and to allow cookies to freely pass between the web page and your Internet browser.

3 To block all cookies, move the slide bar to the top to block all cookies, and then click **OK.**

HINT: Blocking cookies may prevent some web pages from displaying correctly. Some websites store your member name, password, or other information about you in a cookie. If you delete that cookie, you may have to enter your personal information again the next time you visit the site.

14

E-mail



Setting up a new E-mail Account

With an Internet connection and an e-mail service, you can exchange e-mail messages with family, friends, and co-workers over the Internet.

The e-mail software from most service providers offers an Internet Connection Wizard to help you connect to the Internet and set up your e-mail account.

You need the following information from your Internet service provider (ISP) or local area network (LAN) administrator:

- Account name and password
- The names of your incoming and outgoing e-mail servers

NOTE: **Windows Mail** and **Outlook Express** are the default e-mail applications for Windows Vista® and Windows® XP respectively.

FOR MORE INFORMATION: To learn more about using e-mail, see "Getting started with e-mail" in Windows Help and Support: click **Start** or → **Help and Support**.

Windows Vista®

To add (or remove) a Windows Mail account:

1. Click **Start** → **All Programs**→ **Windows Mail**.
2. Click **Tools**→ **Accounts**.
3. Click **Add** or **Remove**, choose the type of account you want to add or remove, click **Next**, and then follow the online instructions.

Windows® XP

To add (or remove) an e-mail account with Outlook Express:

1. Click **Start** → **All Programs**→ **Outlook Express**.
2. Click **Tools**→ **Accounts**.
3. In the **Internet Accounts** dialog box, click **Add** or **Remove**.
4. Select **Mail** or to open the Internet Connection Wizard, and then follow the instructions to establish a connection with an e-mail or news server.

Managing and Organizing E-mail Messages

Many options are available for managing and organizing your e-mail messages. For instance, you can set up multiple e-mail folders, set up e-mail rules and filters, or delete unwanted e-mails.

Windows Vista

To add an e-mail folder:

1. Click **Start** → **All Programs**→ **Windows Mail**.
2. Click **File**→ **Folder**,→ **New**.
3. Type the name of your folder in the **Folder name** box.

4 In the **Select the folder in which to create the new folder** list, click the folder where you want to store your new folder.

> **FOR MORE INFORMATION:** To learn more about deleting or switching folders, see "Add, delete, or rename e-mail folders" in Windows Help and Support: click **Start** or → **Help and Support**.

To create an e-mail rule:

1 Click **Start** → **All Programs**→ **Windows Mail**.

2 Click the message you want to use as a basis for your rule.

3 Click **Message**→ **Create Rule from Message**.

You can then select from a number of options, or "rules," that govern how an e-mail is managed in the future when newly received e-mails have "conditions" that match the e-mail you used as a basis for the rule.

> **EXAMPLE:** You can use the **Where the from line contains** ***condition*** to set a rule so that all messages received from a specified entity (or having a specified word in the **From** field) are automatically sorted and filed in an e-mail folder that you specify.

> **FOR MORE INFORMATION:** To learn more about changing an e-mail rule or applying a rule to downloaded e-mail messages, see "Organize e-mail using rules and folders" in Windows Help and Support: click **Start** or → **Help and Support**.

To delete an e-mail message:

1 Select the message you want to delete, and click **Delete**.

2 To select multiple messages, hold down the <Ctrl> key and click each message you want to delete. Then click **Delete**.

Windows XP

To add an e-mail folder:

1 Click **Start** → **Programs**→ **Outlook Express**.

2 On the **File**→ **Folder**→ **New**.

3 In the **Folder** name text box, type the name and then select the location for the new folder.

To create an e-mail rule:

1 Click **Start** → **Programs**→ **Outlook Express**.

2 Select an e-mail message in the main window.

3 On the **Message** window, click **Create Rule from Message**.

   This creates a simple e-mail rule based on the name of the person on the **From** line; no other information from the message, however, is entered into the rule.

To delete an e-mail message:

1 Click **Start** → **Programs**→ **Outlook Express**.

2 In the message list, click to highlight the message.

3 On the toolbar, click **Delete**.

FOR MORE INFORMATION: To learn more about Outlook Express, see the Outlook Express Help.

Securing Your E-mail

Several options are available for you to make sure that the e-mail messages you receive are secure:

- Set an appropriate security level through your e-mail service (see "Increasing Security for Your Computer While Accessing the Internet" on page 178).
- Reduce spam.
- Protect against viruses and phishing.
- Avoid opening e-mail attachments.

FOR MORE INFORMATION: To learn more about securing your e-mail messages, see the documentation from your e-mail service provider.

Reducing Spam

Set an appropriate security level in your e-mail software (Windows Mail for Windows Vista or Outlook Express for Windows XP) for sorting e-mail that you receive.

Windows Vista

1 Click **Start** → **All Programs**→ **Windows Mail**.

2 Click **Tools**→ **Junk e-mail Options**.

3 Select the protection level you want:

- **No Automatic Filtering**. Click this option if you want to stop blocking junk e-mail messages altogether. However, Windows Mail continues to block messages from domain names and e-mail addresses on your **Blocked Senders** list.
- **Low**. Click this option if you don't receive many junk e-mail messages and want to block only the most obvious junk e-mail messages.
- **High**. Click this option if you receive a large volume of junk e-mail messages and want to block as many as possible. However, you should periodically review the messages in your junk e-mail folder to ensure that there are not any legitimate e-mail messages that might have been moved there as well.
- **Safe List Only**. Click this option if you only want to receive messages from people or domain names on your **Safe Senders** list. E-mail messages from people or domain names not on your **Safe Senders** list will be treated as junk e-mail messages, so you should only choose this option if you are certain that every person or domain name you want to receive messages from is on your **Safe Senders** list.

FOR MORE INFORMATION: To learn more about reducing spam in your e-mail messages, see "Block spam and other unwanted e-mail" in Windows Help and Support: click **Start** or → **Help and Support**.

Windows XP

1. Click **Start** → **Programs**→ **Outlook Express**.
2. Click **Tools**→ **Options**→ **Security** tab.
3. Under **Download Images**, click **Block images and other external content in HTML e-mail**.

FOR MORE INFORMATION: To learn more about reducing spam in your e-mail messages, see "Viewing e-mail images that are blocked" in Outlook Express Help.

Viruses and Phishing

You can choose from the following options to secure your e-mail messages from viruses and phishing:

- Install an antivirus program.
- Read e-mail messages in plain text.
- Verify that attachments are from a secure source.
- Do not open attachments with an extension of **.exe**.

FOR MORE INFORMATION: To learn more about virus protection, see "Using Antivirus Software" on page 256.

Avoiding E-mail Attachments

Some e-mail services automatically block file types that commonly spread e-mail viruses. If an attachment is blocked, the **Information** bar displays a message, to let you know that it has done so, and lists the attachment that has been blocked.

Other e-mail services allow you to select file types to be blocked.

> **FOR MORE INFORMATION:** To learn more about e-mail attachments, see the Help information provided by your e-mail service provider.

Viewing E-mail Messages

1 Open your e-mail service by clicking the icon on your desktop or by clicking **Start** → **All Programs**→ and then clicking the name of the e-mail service (for example, Windows Mail or Outlook Express).

2 Click the mail folder (such as **Inbox**) that contains the messages you want to read.

3 To view the message, click the message in the message list.

> **FOR MORE INFORMATION:** To learn more about viewing e-mail in Windows Mail, see "View e-mail messages in Windows Mail" in Windows Help and Support: click **Start** or → **Help and Support**.

Sending E-mail

After you compose an e-mail message, you are ready to send the e-mail message to a recipient.

Windows Vista

1 Click **Start** → **All Programs**→ **Windows Mail**.

2 Click **File**→ **New**→ **Mail Message** to open a new message composition window.

3 In the **To** box, type the e-mail address for each of your primary recipients.

4 In the **Subject** box, type the subject of your message.

5 Click in the main message window and type your message.

6 To send the message right away, click **Send**.

> **FOR MORE INFORMATION:** To learn more about sending e-mail in Windows Mail, see "Write an e-mail message" in Help and Support: click **Start** or → **Help and Support.**

Windows XP

1 Click **Start** → **Programs**→ **Outlook Express**.

2 On the toolbar, click **Create Mail**.

3 In the **To** box, type the e-mail name of the recipient.

4 In the **Subject** box, type a message title.

5 Type your message, and then click **Send** on the toolbar.

> **FOR MORE INFORMATION:** To learn more about sending e-mail in Outlook Express, see "To send an e-mail message" topic in Outlook Express Help.

Creating a Contact Group (Mailing List)

Contact groups (mailing lists) are useful when composing e-mails to multiple recipients. A contact group is a list of e-mail addresses. By creating contact groups, you can compose one e-mail and send it to multiple recipients.

Windows Vista

1 Click **Start** → **All Programs**→ **Windows Contacts**.

2 On the toolbar, click **New Contact Group**, type a name in the **Group Name** box, and then fill in the boxes on the **Contact Group** tab and **Contact Group Details** tab. You do not have to fill in all the boxes; just type as much information as you want about the new contact group you are creating.

3 Add contacts to the contact group in any of the following ways:

- To add individual contacts to the group from your existing contacts, click **Add to Contact Group**.
- To create new contacts and add them to the contact group, click **Create New Contact**.
- To add new people to the contact group without also adding them to your individual contacts, type the appropriate information in the **Contact Name** and **E-Mail** boxes, and then click **Create for Group Only**.

4 When you have finished creating your contact group, click **OK**.

FOR MORE INFORMATION: To learn more about creating e-mail messages, see "Create contact groups (mailing lists)" in Help and Support: click **Start** or → **Help and Support**.

Windows XP

1 Click **Start** → **Programs**→ **Outlook Express**.

2 In the **Address Book**, select the folder in which you want to create a group. Click **New** on the toolbar, and then click **New Group**.

3 The **Properties** dialog box opens. In the **Group Name** box, type the name of the group.

4 Add contacts to the contact group in any of the following ways:

- To add a person from your **Address Book** list, click **Select Members**, and then click a name from the **Address Book** list.
- To add a person directly to the group without adding the name to your Address Book, type the person's name and e-mail address in the lower half of the **Properties** dialog box, and then click **Add**.

- To add a person to both the group and your Address Book, click **New Contact** and fill in the appropriate information.
- To use a directory service, click **Select Members**, and then click **Find**. Select a directory service from the drop-down list at the end of the text box.
  After finding and selecting an address, it is automatically added to your Address Book.

5 Repeat for each addition until your group is defined.

Backing Up E-mail Messages

You can back up your e-mail messages and other files for safekeeping while increasing (or freeing up) your disk space.

Windows Vista

1 Click **Start** → **System and Maintenance**→ **Backup and Restore Center**.

2 Click **Back up files**, and then follow the steps in the wizard. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

FOR MORE INFORMATION: To learn more about backing up e-mail messages, see "Back up your files" in Help and Support: click **Start** or → **Help and Support**.

Windows XP

1 Click **Start** → **Programs**→ **Outlook Express**.

2 Select an e-mail folder.

3 Click **File**→ **Folder**→ **Compact**.

4 To back up the folder, copy it to a backup folder, optical media, or network drive. Outlook Express e-mail folders have a **.dbx** extension (for example, **Sent Items.dbx**).

FOR MORE INFORMATION: To learn more about backing up e-mail messages, see "To compact and back up e-mail folders" in Outlook Express Help.

15

Multimedia (CDs/DVDs, 5.1 Audio, MP3s, TVs, Digital Cameras, and Projectors)



Overview

Most Dell computers come with a CD/DVD player/recorder, which can be used for data, music or videos. Depending on the computer, you can also connect other media devices, such as digital cameras, projectors, MP3 Players, and TVs. You can view and print digital photos, play CDs and DVDs, create your own CDs, listen to radio stations, and copy files to a laptop media device, such as an MP3 player.

FOR MORE INFORMATION: To learn more about connecting your computer to a TV and adjusting the display settings based on the type of connection, see "Connecting Your Computer to a TV and Adjusting Display Settings" on page 215.

CDs, DVDs, and Blu-ray Disc™ Media

Some computers may come equipped with media buttons for:

- Playing various media
- Transferring and backing up data
- Entertainment

For instructions on using these buttons see the documentation that came with your computer.

Playing a CD, DVD, or Blu-ray Disc Media



For Drives With Spindles and/or Trays

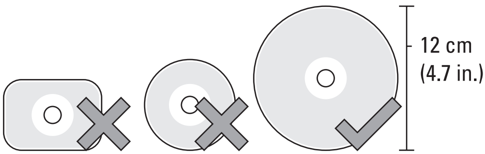
1. Press the eject button on the drive.
2. Place the media, label side up, in the center of the tray and snap it onto the spindle, or place it on the tray if there is no spindle.
3. Push the tray back into the drive.
4. For those computers equipped with multimedia buttons, press the **Play** button.

   Some computers launch an auto-play selection window. Select the function for the task you are attempting to accomplish such as open for viewing or open for direct data transfer.

For Drives With a Slot



NOTICE: Do not use non-standard-size or shape discs (including mini-CDs and mini-DVDs) as you will damage the drive.



NOTE: Do not move the computer while playing or recording CDs and DVDs.

1. Press the eject button to remove a pre-installed cd. For the location of the eject button, see the documentation shipped with your computer.
2. Slide the disc, label side up, in the drive slot.
3. For those computers equipped with multimedia buttons, press the **Play** button.

   Some computers launch an auto-play selection window. Select the function for the task you are attempting to accomplish such as open for viewing or open for direct data transfer.

To format media for storing or copying data, see the media software that came with your computer.

NOTE: Ensure that you follow all copyright laws when copying media.

Copying CD, DVD, or Blu-ray Disc Media

1. Click **Start**→ **All Programs**→ <*your CD/DVD software*> → **Projects**→ **Copy**.
2. Copy the disk.

With a Single Disk Drive:

a Insert the source disk into the drive.

b Ensure that the settings are correct, and then follow the instructions online.

The computer reads your source disk and copies the data to a temporary folder on your hard drive.

c When prompted, insert a blank disk into the drive and click **OK**. The computer copies the data from the temporary folder to the blank disk.

With Dual Disk Drives:

a Select the drive for the source disk (and insert the disk).

b Then insert a blank disk into the second disk drive, and follow the instructions to copy a disk

The computer copies the data from the source disk to the blank disk. When you have finished copying the source disk, it automatically ejects.

HINT: Use Microsoft® Windows® Explorer to drag and drop files to a disk only after you start your CD/DVD creation software and open a <*create CD/DVD*> project.

- Use a blank disk to practice recording.
- You may not be able to create audio DVDs with your CD/DVD software. See the manufacturer's instructions on the website for the media software installed in your computer.
- If you have Roxio software, see the Roxio website at www.sonic.com or the Blu-ray Disc™ Association website at blu-raydisc.com for additional information.

5.1 Audio

NOTE: 5.1 Audio may not be supported on all computers.

5.1 refers to the number of audio channels in most surround-sound configurations. The **5** refers to the five main audio channels: left front, center front, right front, left surround and right surround; while the **1** refers to the low frequency effects channel (LFE).

A **5.1** signal can be provided by the optical media or a satellite TV channel.

Setting up the 5.1 Audio Connections

To set up the 5.1 audio connections:

Click **Start** →**Control Panel**→**Additional Options**. Run **IDT Audio Control Panel**. In the **Jacks** tab, there are three connector icons. Follow the instructions to finish the setup.

1. Click the microphone icon, select **Device: Rear Speakers**, and plug your rear speaker cable to the audio in/microphone connector.
2. Click the middle headphone icon, select **Device: Center/LFE Speaker**, and plug your center/woofer speaker cable to the middle audio out/headphone connector.
3. Click the right headphone icon, select **Device: Front Speaker**, and plug your front speaker cable to the right audio out/headphone connector.

Laptop Media Devices (MP3 Players)



FOR MORE INFORMATION: To learn more about connecting your laptop media device to your computer and for playing your laptop media device (MP3 Player), see the documentation that came with the device. Also, see "Using Windows Media Player" in Windows Help and Support: click **Start** or → **Help and Support**.

Connecting a Laptop Media Device (MP3 Player) to Your Computer

Follow the instructions that came with your media device to connect it to your computer.

To determine if your laptop media device is compatible with Media Player, see the instructions that came with your media device. Also, see the windowsmedia.com website.

Setting up the Laptop Media Device to Sync in Windows Media Player

Use Windows Media Player to sync digital media files from your media library to the laptop media device.

If your laptop media device has sufficient capacity to hold the files you want to copy, Media Player *automatically* syncs your media library. Then, when you connect the laptop media device to your computer in the future, Media Player updates the device.

If the storage capacity of the laptop media device is not large enough to handle the files you want to copy, Media Player defaults to manual sync. At this point, you must manually remove files from the device or alter your selection of files to copy.

Media Player allows you to switch between automatic and manual sync operations.

Setting up the Laptop Media Device the First Time

When you connect a media device for the first time, Media Player selects the sync method that works best for your device, depending on its storage capacity.

1. Start the laptop media device, and then connect the device to your computer. If prompted, select the option to sync the device using Windows Media Player.
2. Do one of the following:
   - If Media Player has selected to sync your device automatically, click **Finish**. When you click **Finish**, Media Player syncs your entire library to the laptop media device. Then, your laptop media device syncs automatically every time you connect it to your computer.
   - If Media Player has selected to sync your device manually, click **Finish**. Then, in the **Sync** tab, select the files and play lists you want to sync.

Copying Audio and Video Files to Your Laptop Media Device

Use the **Copy to CD or Device** feature to copy audio and video files from **Media Library** to your laptop media device or storage card.

You can also copy licensed files that you download from the Internet or that you copied from CDs to your laptop media device. To copy a licensed file, your laptop media device may require a hardware serial number. The content provider decides the ownership and play rights for a file, and not all files will play after you have copied them to a laptop device.

When you copy files to your laptop media device, the **Status** column in the **Items to Copy** window displays status information, such as **Inspecting**, **Converting/Converted**, **Copying**, and **Complete**.

Playing Media Using the Dell Travel Remote



The Dell Travel Remote is designed to control Windows Vista Media Center and is available only for specified computers.

1 Install a coin-cell battery into the remote control.
2 Launch the Windows Vista Media Center.
3 Use the remote control buttons to play media.

FOR MORE INFORMATION: To learn more about Dell Travel Remote, see the Dell Support website at **support.dell.com**. Also, see the instructions that came with the Dell Travel Remote.

Adjusting the Volume on Your Computer

1 Right-click the **Volume** icon in the taskbar.
2 Click **Open Volume Mixer**.
3 Click and drag the slide bar up or down to increase or decrease the volume.

Enabling S/PDIF Digital Audio Through the Media Software

If your computer has a DVD drive and supports digital audio (S/PDIF), you can enable digital audio for DVD playback.

1 Click **Start**→ **All Programs**, and click the link for the DVD player.
2 Insert a DVD into the DVD drive.

   If the DVD begins playing, click the stop button.

3 Click **Settings→ DVD→ DVD Audio Setting**.

4 Click the arrows beside the **Speaker Configuration** setting to scroll through the options, and select the **SPDIF** option.

5 Click the **Back** button once, and then click the **Back** button again to return to the main menu screen.

Enabling S/PDIF Digital Audio in the Windows Audio Driver

1 Double-click the **Volume** icon in the taskbar.

2 From the **Volume Control** window, click **Options→ Advanced Controls→ Advanced**.

3 Click the check box to enable **S/PDIF Interface**.

4 Click **Close→ OK**.

Setting up the Cyberlink (CL) Headphones

NOTE: The CL headphone feature is available only if your computer has a DVD drive.

If your computer has a DVD drive, you can enable digital audio through headphones for DVD playback.

1 Click **Start→ All Programs**, and click the option for the DVD player for your computer.

2 Insert a DVD into the DVD drive.

If the DVD begins playing, click the stop button.

3 Click **Settings→ DVD→ DVD Audio Setting**.

4 Click the arrows beside the **Speaker Configuration** setting to scroll through the options, and click **Headphones**.

5 Click the arrows beside the **Audio listening mode** setting to scroll through the options, and click **CL Headphone**.

6 Click the arrows beside the **Dynamic range compression** option to select the most suitable option.

7 Click the **Back** button once, and then click the **Back** button again to return to the main menu screen.

Using a Digital Camera With Your Computer



When you use a digital camera with your computer, you can perform one or more of the following tasks:

- View and download pictures on your camera.
- Modify pictures and add special effects.
- Print pictures.
- Organize your picture collection.
- Create slide shows.

FOR MORE INFORMATION: To learn more about using a digital camera with your computer, see the documentation that came with your camera. Also, search for topics on digital cameras in Windows Help and Support: click **Start** or → **Help and Support**.

Using Windows Media Player

Windows Media Player is Microsoft's native software for playing, recording, and organizing your multimedia files. You can use Windows Media Player for a variety of activities, including:

- Playing digital media files, including audio and video files, CDs and DVDs, and other media files and formats

- Burning (creating) your own CDs and DVDs as well as copying music from CDs
- Listening to radio stations
- Searching and organizing your digital media files
- Copying and syncing files to laptop devices
- Shopping for digital media online

FOR MORE INFORMATION: To learn more about using the Windows Media Player, see Windows Help and Support: click **Start** or → **Help and Support**.

16

Connecting Your Computer to a TV and Adjusting Display Settings



Accessing a TV With Your Computer Using a TV Tuner Card

You can use a TV tuner card, a special video adapter, to view and record TV on your computer. A TV tuner card may replace your current video card or it may work with your current video card.

For more information about watching and recording TV on your computer, see the documentation that came with your TV tuner card.

Connecting Your Computer to a TV or Audio Device

There are a variety of ways to connect computers to a TV. Possible connections include:

- VGA
- Coaxial cable
- S-video; S-video/composite; S-video/component

- DisplayPort™
- Digital Video Interface (DVI) or High Definition Multimedia Interface (HDMI)

In addition, possible audio connections to support the video connections vary from standard analog RCA jacks to S/PDIF digital audio and multi-channel digital audio through optical cable.

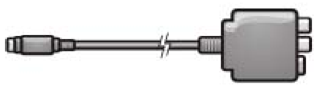
All of these video and audio connection options vary for each computer and TV. Examine the back and sides of both your computer and your TV to determine what options are available.



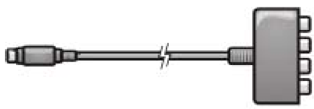
S-video



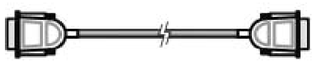
Composite video



Component video



DVI digital video



HDMI video/audio



DVI/HDMI converter



You may need to navigate through a great deal of information in order to understand the possible selections for these video and audio connections.

See the documentation that came with your computer and your TV. You may also want to take advantage of some of the tutorials available on the Internet.

Determining What you Have and What you Need

Before you connect your computer to a TV and speakers, you need to determine:

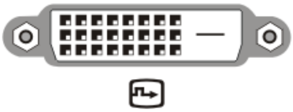
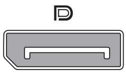
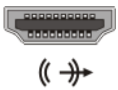
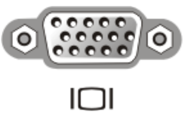
- Types of connectors available on the computer and TV
- Whether there are special adapters (composite, component)
- Types of cables required for the connections
- The types of tasks you plan to perform

Having this information can help ensure that you use the right connectors, adapters, and cables and that you connect them correctly.

Identifying the Connectors on Your Computer

Your computer may be equipped with a variety of video-out or TV-out connectors.

Connector	Description/Function
	An S-video connector allows you to connect digital/audio capable devices using the TV/digital audio adapter cable.

Connector	Description/Function
	A DVI connector allows you to connect an external DVI-compatible monitor, such as flat-panel monitors or TVs. DVI connectors are available for DVI-D (digital only), DVI-A (high-resolution analog), and DVI-I (digital and analog). **NOTE:** DVI-A, DVI-D, and DVI-I connectors are non-interchangeable. Cables for each are unique. Make sure that you know which format your computer supports.
	DisplayPort allows you to connect a computer and a home-theater system. For more information see "DisplayPort™ - Features and Benefits" on page 56 and "DisplayPort™" on page 327.
	A HDMI connector allows you to connect an external HDMI-compatible monitor or TV. HDMI transfers uncompressed video and multi-channel audio over a single cable. **NOTE:** DVI and HDMI are compatible and there are converter cables available. If your computer does not have an HDMI connector and your TV does not have a DVI connector, use your computer’s DVI connector with a DVI/HDMI converter cable to connector to the HDMI port on the TV. You will need to connect a separate cable for audio because the DVI connector does not transmit the audio signal.
	A VGA connector allows you to connect an external VGA-compatible monitor.

Connector	Description/Function
	An audio connector allows you to connect to standard audio, S/PDIF digital audio, or multi-channel analog audio.
	A headphone/line-in connector allows you to connect headphones to your computer. You can also use this connector for standard audio connection to speakers.

HINT: DON'T FORGET THE AUDIO: Connect an audio cable if you want to hear the sound on anything other than your computer's speakers.

S-video cables generally transmit video only. However, certain component adapters that connect through the S-video TV-out connector may include audio ports for speaker connections.

Identifying the Connectors on Your TV

Your TV may be equipped with a variety of input connections, such as an S-video connector, a DVI connector, a HDMI connector, or a VGA connector. In addition, the TV may have multiple access ports for each of these types of connections.

NOTE: To determine which types of connections are available with your TV, see the documentation that came with your TV.

To connect your computer to a TV, you need to link the selected computer video output port (S-video, VGA, DVI, or HDMI) and the appropriate television video-input connector.

See the documentation that came with your TV for additional information.

Determining the Combination of Cables and Adapters you Need

Once you have identified which ports are available on your computer and TV, determine which combination of cables and adapters you will need:

- Video adapter and cable

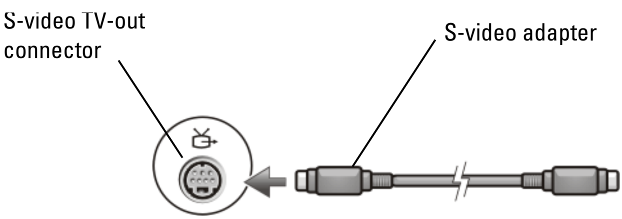
- VGA connector and VGA cable
  - Standard S-video connector and S-video cable
  - Composite adapter with composite-video cable
  - Component adapter with component-video cable
  - DVI connector with DVI cable or DVI/HDMI converter cable
  - HDMI connector with HDMI cable or DVI/HDMI converter cable
  - DisplayPort connector with DisplayPort cable or DisplayPort/DVI converter cable
- Audio adapter and cable
  - Standard analog audio
  - S/PDIF digital audio
  - Multi-channel analog audio

Depending on the connectors that are available on your computer and your TV, you can connect your computer to your TV in a variety of configurations.

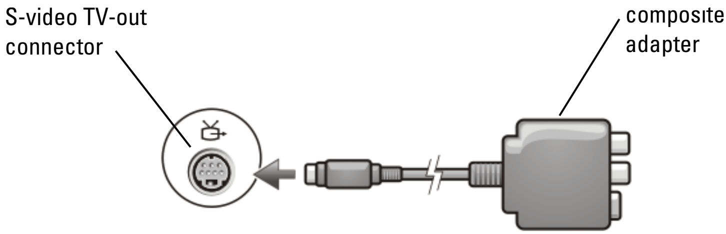
NOTE: Video and audio cables for connecting your computer to a TV or other audio device may not be included with your computer. Cables and TV/digital audio adapter are available for purchase from Dell.

NOTE: If video or audio adapters and cables came with your computer, use them. Do not interchange adapters or cables from other computers.

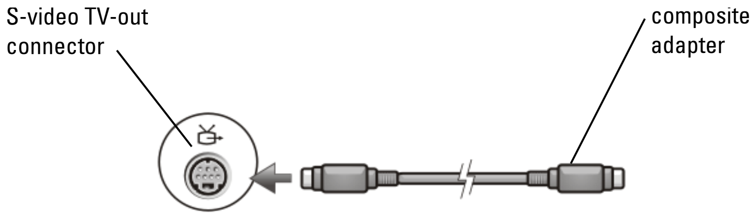
Standard S-video Adapter



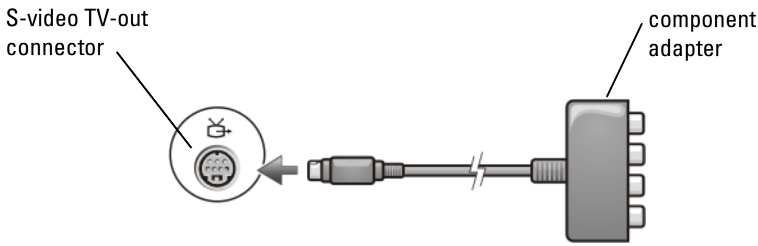
Multi-Port Composite Adapter



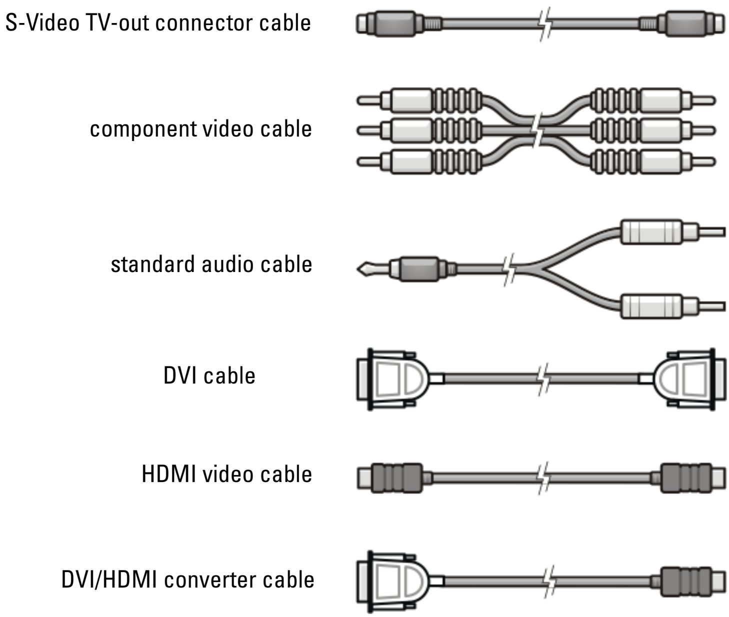
Single-Port Composite Adapter



Component Adapter



Cables



Physically Connecting Your Computer to a TV or Audio Device

If you want to connect your computer to a TV or audio device, it is recommended that you connect video and audio cables to your computer in one of the following combinations.

Quick Reference for Possible Configurations

NOTE: These configurations may or may not be supported by your computer and TV.

NOTE: See the documentation that came with your computer and TV.

Configuration	**Remarks**
S-video • S-video adapter with standard audio • S-video adapter and multi-channel analog audio adapter	Standard Generally available and easy to connect
Composite Video • Composite adapter with standard audio • Composite adapter with S/PDIF digital audio • Composite adapter with multi-channel analog audio adapter	Okay Quality may be lower than component video or S-video
Component Video • Component adapter with standard audio • Component adapter with S/PDIF digital audio • Component adapter with multi-channel analog audio adapter	**Recommended**
DVI Video (Digital Video Interface) • DVI adapter with standard audio	Okay Quality may not be as good as component video
DisplayPort • DisplayPort /DVI converter with standard audio	**Recommended**
HDMI Video • HDMI/DVI converter with standard audio	Best May not be available

Performing the Basic Connection Steps

1. Determine the type of connection you want to use.
2. Ensure that you have the correct video and audio adapters and cables.
3. Turn off the TV, the audio devices, and the computer.
4. Based on the type of connection selected, connect the video adapters and cables.
5. Connect the audio cables that are appropriate for the selected video connection.
6. Turn on the television and any audio device that you connected (if applicable).
7. Select the appropriate input video signal mode for the television (such as AV-5, AV-6 for component dongle). The input video mode should match the type of connection. See "Selecting the Correct Input Signal From the TV Menu" on page 226. Also see the documentation that came with your television.
8. Turn on your computer.
9. When you finish connecting the video and audio cables between your computer and your TV, you must enable your computer to work with the TV.

   A variety of methods are available to set up the display arrangement:

   - **Vendor video card control panel — Preferred**

     From the operating system Control Panel, click **Display**→ **Settings**→ **Advanced.**

     Then select the tab for the video card vendor. Use the control panel that is displayed for the video card to select the display settings.

   - **Function key combination —** Can be used to select display arrangement but these are best used to cycle through views after display settings are chosen

     Press <Fn><F8> to select the desired display arrangement.

- **Operating system Display Properties menu —** Can be used to select display arrangement but may cause conflicts with vendor settings for the video card.

  From the **Control Panel**, click **Display Properties** → **Settings**

Some vendor video card control panels provide a **TV Setup Wizard** to help you adjust the display settings for the TV.

To ensure that the computer recognizes and works properly with the TV, see:

- "Selecting the Correct Input Signal From the TV Menu" on page 226
- "Enabling the Display View for the Computer and the TV" on page 239

10 Set up the TV (which is represented as the 2nd monitor in the **Display Properties** menu) to function as:

- Clone (show the same display as the computer monitor)
- Extended screen (expand the display area of the computer monitor)
- Primary display (cannot select this option for some situations)

11 Access the TV menu and select the appropriate input signal for the physical connection that you have set up. See "Selecting the Correct Input Signal From the TV Menu" on page 226.

12 If you are using S/PDIF digital audio, you must enable the computer to work with S/PDIF digital audio (see "Enabling S/PDIF Digital Audio Through the Media Software" on page 210 and "Enabling S/PDIF Digital Audio in the Windows Audio Driver" on page 211).

Tips

Action	Remember
Adjusting display settings	Use the vendor control panel for the video card to set the display configuration. This method provides the best coordination for video card and TV display resolution.

Connect while TV and computer are turned off	**1** Turn off the computer and TV. **2** Connect the computer and TV. **3** Then turn the TV on. **4** Next, turn on the computer to allow it to detect the connection to the TV. The computer recognizes the TV as an available external display.
S/PDIF—Ensure that your computer supports it	Before selecting S/PDIF digital audio, ensure that your computer supports S/PDIF.
Multiple connectors — Keep audio and video together	If you are connecting to a TV that has multiple video and audio connectors available, connect the audio cables to the same row of connectors as the video cables. For example, if the TV has a row of video and audio connectors for AV5 and a row for AV6, ensure that both video and audio are connected to either AV5 or AV6 but not both.

Selecting the Correct Input Signal From the TV Menu



If your TV has multiple input connectors, it generally has a TV menu that allows you to:

- Select the appropriate input source based on the type of physical connection.
- Make adjustments to the image and audio settings.
- Select other options.

FOR MORE INFORMATION: To learn more about input settings, see the documentation that came with your TV for available settings.

Access the menu for your TV and select the option that allows you to choose the proper source for the incoming signal based on how you have your TV and computer connected.

NOTE: You may be able to access the TV menu from the TV remote control. Examine the remote for a button labeled "Menu." Press the **Menu** button and select the feature that allows you to specify the input signal for the TV.

Select the source for the input signal that corresponds to the input that you have connected from your computer to the TV. For example, your TV menu may show a screen similar to the following example:

TV Menu Example

Input Select
Back
1. VGA
2. HDMI 1
3. HDMI 2
4. TV
5. DIGITAL TV
6. AVI (Composite 1)
7. AV2 (Composite 2)
8. AV3 (S-Video 1)
9. AV4 (S-Video 2)
10. AV5 (Component 1)
11. AV6 (Component 2)
12. AV7 (Component 3)
13. AV8 (S-Video 3)
SHOW INPUTS <-- ALL ACTIVE -->

EXAMPLE: If you are connecting an S-Video cable from the computer to the TV and you have inserted it into the S-Video connection labeled **S-Video 1** on the back of the TV, then select option #8 for AV3 (S-Video 1).

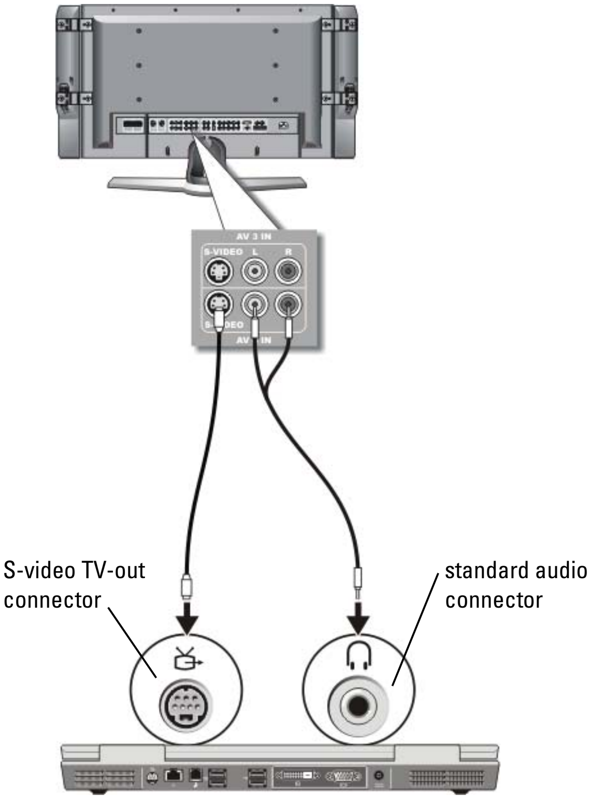
What to do If the TV Does not Recognize a Signal

1. Turn off the TV.
2. Disconnect the S-Video cable from the TV.
3. Look on the back of the TV for the connection labeled **S-Video 1**.
4. Reconnect the S-Video cable to the correct connection for **S-Video 1**.
5. Turn on the TV.
6. Access the TV menu and select option #8 AV3 (**S-Video 1**).
7. Access the **Display Properties Menu** on the computer.
8. Select the tab for the vendor video card.
9. Use the vendor video card control panel to select the appropriate display settings.

FOR MORE INFORMATION: To learn more about using a video card control panel, see "Using a Video Card Wizard to Configure Display Settings" on page 247.

Evaluating Suggested Connection Configurations

S-Video and Standard Audio



NOTE: You can connect an S-video cable directly to the S-video TV-out connector on the computer (without the TV/digital audio adapter cable) if your TV or audio device supports S-video but not S/PDIF digital audio.

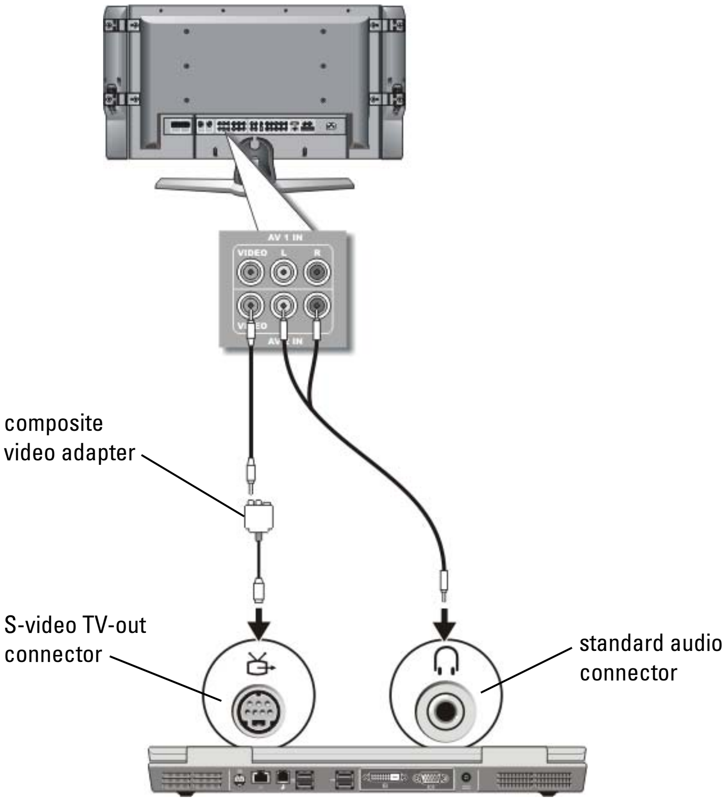
1 Plug one end of the S-video cable into the S-video output connector on the computer.

2 Plug the other end of the S-video cable into the S-video input connector on your TV.

3 Plug the single-connector end of the audio cable into the headphone connector on your computer.

4 Plug the two RCA connectors on the other end of the audio cable into the audio input connectors on your TV or other audio device.

Composite Video and Standard Audio

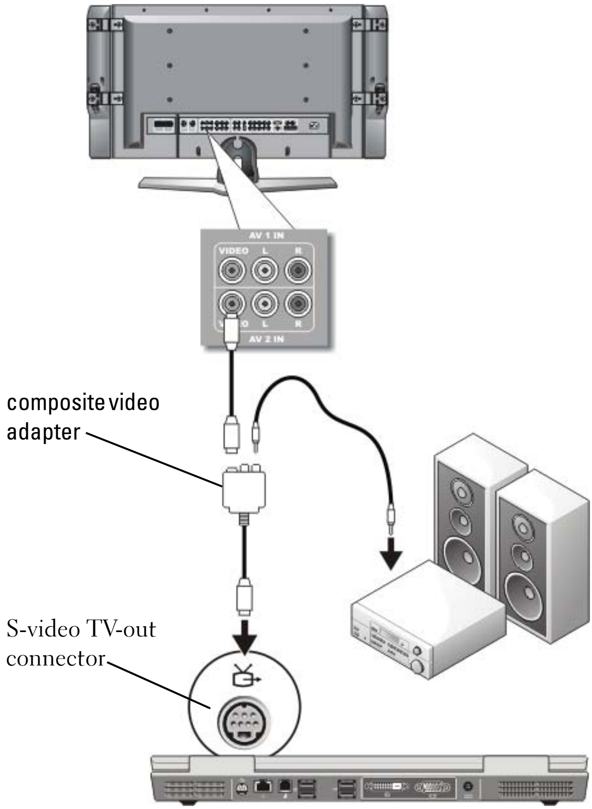


NOTE: Depending on the computer, the composite video adapter may be a single port or multi-port dongle. See the documentation shipped with your computer.

1 Connect the composite video adapter to the S-video TV-out connector on your computer.

2. Plug one end of the composite video cable into the composite video-output connector on the composite video adapter.
3. Plug the other end of the composite video cable into the composite video-input connector on the TV.
4. Plug the single-connector end of the audio cable into the headphone connector on the computer.
5. Plug the two RCA connectors on the other end of the audio cable into the audio input connectors on your TV or other audio device.

Composite Video and S/PDIF Digital Audio



NOTE: Depending on the computer, the composite S-video adapter may be a single port or multi-port dongle. For more information, see the documentation shipped with your computer.

1 Connect the composite S-video adapter to the S-video TV-out connector on the computer.

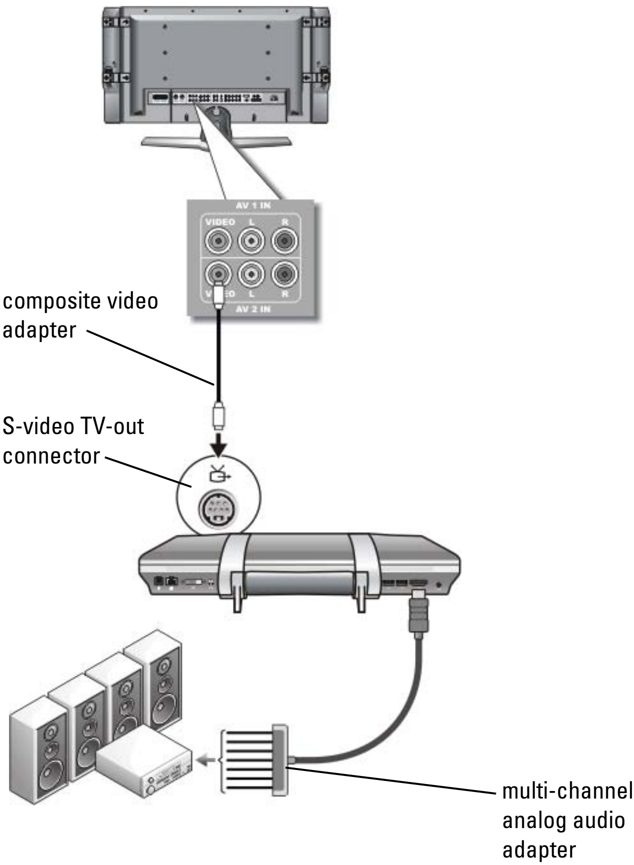
2 Plug one end of the composite video cable into the composite video-input connector on the composite video adapter.

3 Plug the other end of the composite video cable into the composite video-input connector on the TV.

4 Plug one end of the S/PDIF digital audio cable in to the S/PDIF audio connector on the composite video adapter.

5 Plug the other end of the digital audio cable into the S/PDIF input connector on your TV or other audio device.

Composite Video and Multi-Channel Analog Audio



NOTE: Only certain computers offer the multi-channel analog audio adapter dongle, as shown in the example. For information about the types of connectors available for your computer, see the documentation shipped with your computer.

NOTE: Depending on the computer, the composite S-video adapter may be a single port or multi-port dongle. For more information, see the documentation shipped with your computer.

1 Connect the composite video adapter to the S-video TV-out connector on the computer.

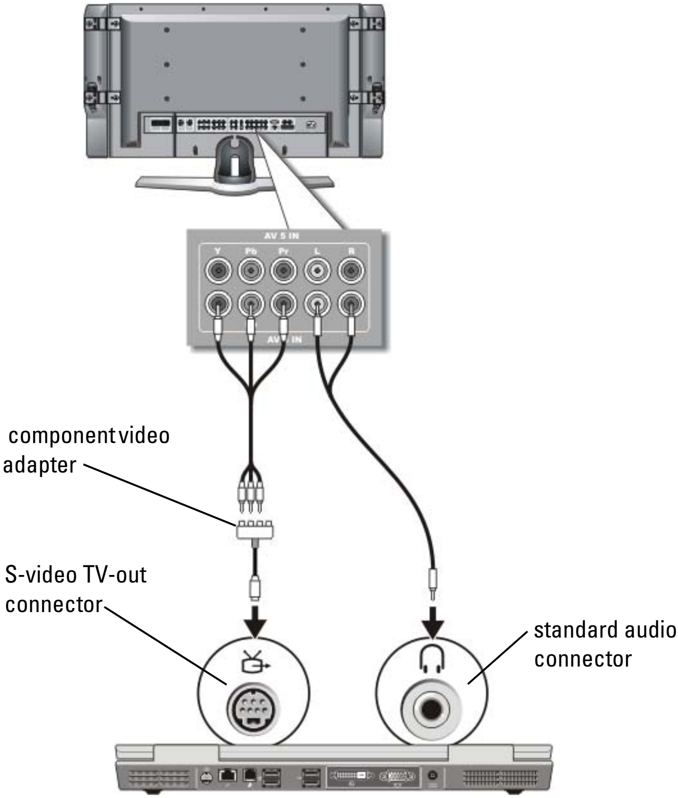
2 Plug one end of the composite video cable into the composite video-input connector on the composite video adapter.

3 Plug the other end of the composite video cable into the composite video-input connector on the TV.

4 Plug one end of the multi-channel analog audio adapter into the audio connector on the computer.

5 Plug the other end of the multi-channel analog audio adapter cable into the audio input connector on your TV or other audio device.

Component S-Video and Standard Audio



1 Connect the component S-video adapter to the S-video TV-out connector on your computer.

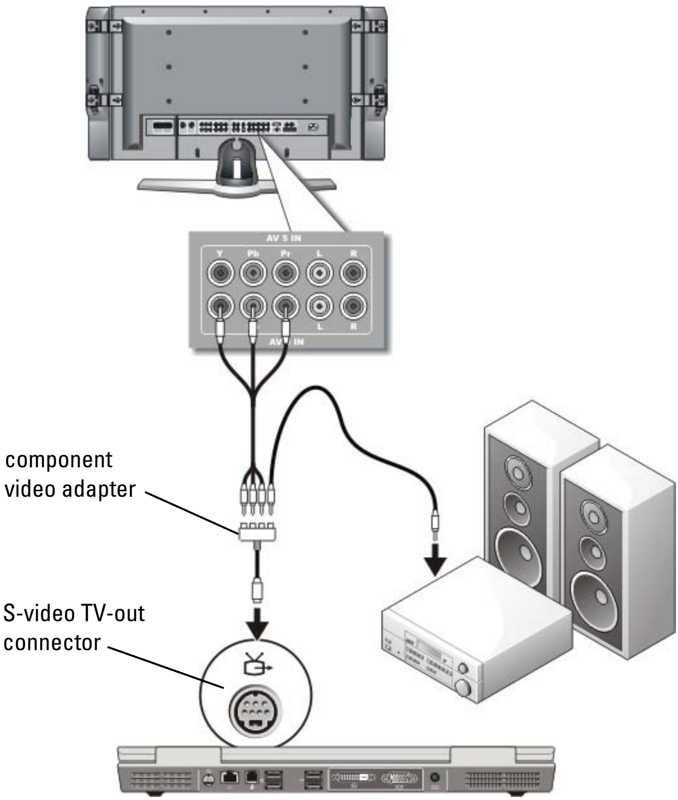
2 Plug all three ends of the component video cable into the component video-output connectors on the component video adapter. Make sure that the red, green, and blue colors of the cable match the corresponding adapter ports.

3 Plug all three connectors from the other end of the component video cable into the component video-input connectors on the TV. Make sure that the red, green, and blue colors of the cable match the colors of the TV input connectors.

4 Plug the single-connector end of the audio cable into the headphone connector on the computer.

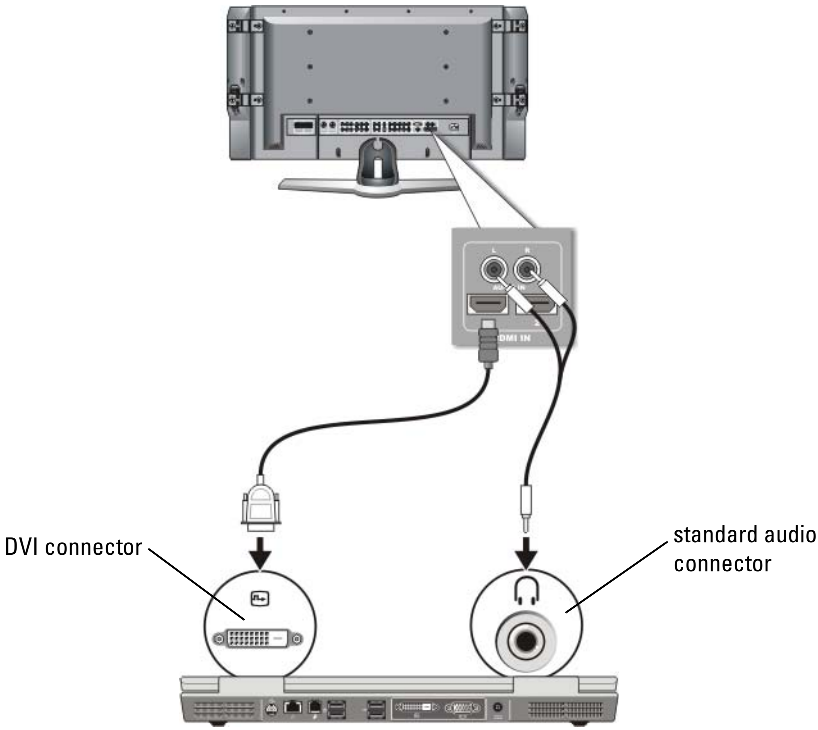
5 Plug the two RCA connectors on the other end of the audio cable into the audio input connectors on your TV or audio device.

Component Video and S/PDIF Digital Audio



1 Connect the component video adapter to the S-video TV-out connector on the computer.
2 Plug all three ends of the component video cable into the component video-output connectors on the component video adapter. Make sure that the red, green, and blue colors of the cable match the corresponding adapter ports.
3 Plug all three connectors from the other end of the component video cable into the component video-input connectors on the TV. Make sure that the red, green, and blue colors of the cable match the colors of the TV input connectors.
4 Plug one end of the S/PDIF digital audio cable into the S/PDIF audio connector on the component video adapter.
5 Plug the other end of the digital audio cable into the S/PDIF input connector on your TV or other audio device.

DVI Connector



1 Connect the DVI video adapter to the DVI connector on the computer.

2 Plug the other end of the DVI video cable into the DVI video-input connector on the TV.

3 Plug the single-connector end of the audio cable into the headphone connector on the computer.

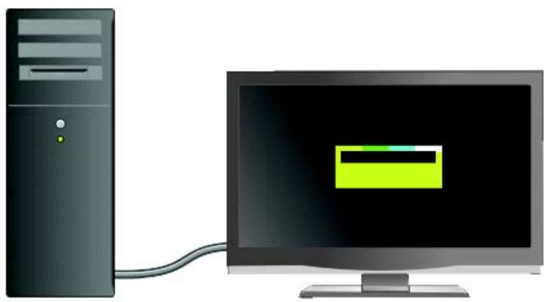
4 Plug the two RCA connectors on the other end of the audio cable into the audio input connectors on your TV or audio device.

Enabling the Display View for the Computer and the TV

Verify the Connection to the TV

To ensure that the display options appear correctly, connect the TV to the computer before you enable the display settings.

For more information on physical connections, see "Physically Connecting Your Computer to a TV or Audio Device" on page 222.



Verify the Input Signal for the TV

If the TV does not recognize the input signal from your computer, access the TV menu to select the correct input signal configuration. See "Selecting the Correct Input Signal From the TV Menu" on page 226.

Set up the TV as a Display Device

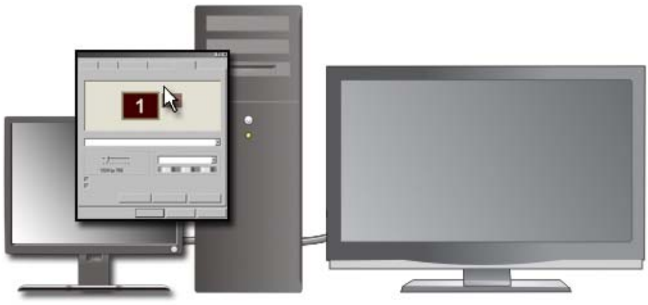
You can use a TV as a monitor for:

- Extended desktop
- A clone of the desktop (an exact copy of the primary display)
- Primary display

Configure the Display Views

After you have successfully connected your computer to your TV or projector, you can configure the display for the computer and the TV or projector by using the following:

- Windows **Display Properties Settings**
- Video card display control menu
- TV or Projector display control wizards



Use the **Display Properties** menu to enable the TV monitor as a display device for your computer.

1. Click **Start** → **Control Panel.**
2. Click the category for appearance and themes. (The name of this option may vary for different versions of the operating systems.)
3. Double-click **Display**. The **Display Properties** menu appears.

   Note that tabs on this menu include:

   - Themes
   - Screen Saver
   - Settings
   - Desktop
   - Appearance

4 Click **Settings.**

The **Settings** screen shows two display monitors labeled 1 and 2. If you have not successfully hooked the TV to your computer, one of the monitors will appear grayed out and you will not be able to select it. Recheck your computer-to-TV connections.

5 Under the **Display:** section, select the appropriate option for using either a single display or multiple displays, ensuring that the display settings are correct for your selection.

Dual Independent Display Mode

You can attach an external monitor or projector to your computer and use it as an extension of your display (known as "dual independent display" or "extended desktop" mode).

This mode allows you to use both screens independently and drag objects from one screen to the other, effectively doubling the amount of viewable work space.

1 Connect the external monitor, TV, or projector to the computer.

2 Access the **Display Properties** window through the **Control Panel**.

3 In the **Display Properties** window, click the **Settings** tab.

NOTE: If you choose a resolution or color palette that is higher than that supported by the display, the settings adjust automatically to the closest supported values. For more information, see your operating system documentation.

4 Click the monitor 2 icon, select the **Extend my Windows desktop onto this monitor** check box, and click **Apply**.

5 Change **Screen Area** to the appropriate sizes for both displays and click **Apply**.

6 If prompted to restart the computer, click **Apply the new color setting without restarting** and click **OK**.

7 If prompted, click **OK** to resize your desktop.

8 If prompted, click **Yes** to keep the settings.

9 Click **OK** to close the **Display Properties** window.

To Disable Dual-Independent Display Mode

1 Click the **Settings** tab in the **Display Properties** window.

2 Click the monitor 2 icon, clear the **Extend my Windows desktop onto this monitor** check box, and click **Apply**.

If necessary, press <Fn><F8> to bring the screen image back to the computer display.

Swapping Primary and Secondary Displays

To swap your primary and secondary display designations (for example, to use your external monitor as your primary display after docking):

1. Access the **Display Properties** window and click the **Settings** tab.
2. Click **Advanced**→ **Displays** tab.

For more information, see the documentation that came with your video card or see "Adjusting Display Settings With the Vendor Video Card Control Panel" on page 246.

Switching the Display Image

When you start the computer with an external device (such as an external monitor or projector) attached and turned on, the image may appear on either the computer display or the external device, depending on your settings.

Press <Fn><F8> to switch the display image between the display only, the external device only, or the display and the external device simultaneously.

Configuring Display Settings

You may use the Windows **Display Properties** menu to set up the display configuration and adjust display settings for your computer when connecting your computer to a TV.

> **FOR MORE INFORMATION:** To learn more about configuring display settings, see "Setting Display Resolution With the Windows Display Properties Menu" on page 243.

HINT: If you are using a TV as a second display device, the best method for configuring the display resolution is the video card control panel available through the video card installed in your computer.

Depending on the video card installed in your computer, your computer may have a special video control panel with extensive help information. The video card control panel may also provide special wizard software to enable the TV display option, along with custom display settings.

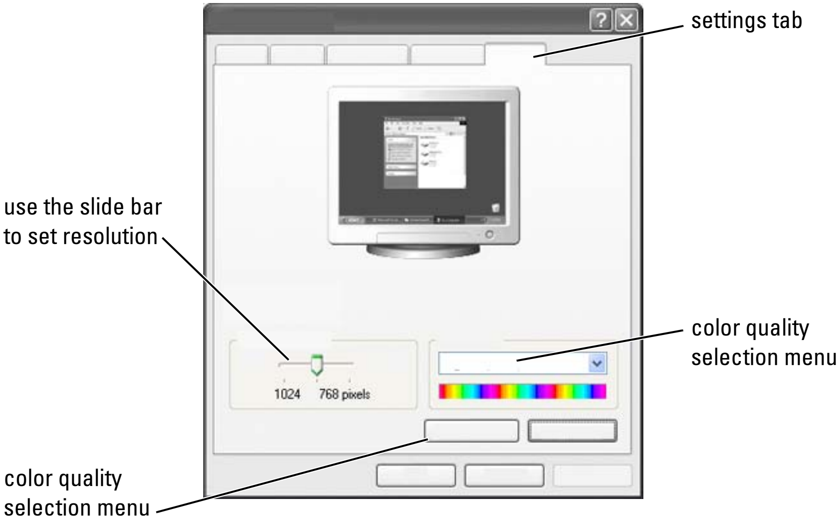
Setting Display Resolution With the Windows Display Properties Menu

Use the Windows **Display Properties** menu to adjust the display resolution for the computer display.

NOTE: You can also use the video card control panel available through the **Display Properties** menu. From the **Display Properties** window, click **Settings**→ **Advanced**. Then select the tab for the video card vendor. For more information, see "Adjusting Display Settings With the Vendor Video Card Control Panel" on page 246.

NOTE: To display a program at a specific resolution, both the video card and the display device must support the program, and the necessary video drivers must be installed.

Accessing the Settings tab of the Display Properties Menu



Windows Vista

1. Right-click an open area of the desktop.
2. Click **Personalize**. The **Personalize appearance and sounds** window appears.
3. Click **Display Settings**.
4. In the **Display Settings** window under **Resolution**, move the slide bar to the left or right to decrease/increase the screen resolution.
5. Click **OK**.

Windows XP

1. From the **Control Panel**, access the **Display Properties** menu.
2. From the **Display Properties** menu, select the **Settings** tab. The **Settings** tab allows you to adjust screen resolution and color quality. The **Settings** tab also provides a **Troubleshoot** button, which takes you to Windows Help and Support.
3. Try different settings for **Color quality** and **Screen resolution**.

NOTE: As the resolution increases, icons and text appear smaller on the screen.

HINT: The capacities of your display and video card determine how much you can change the screen resolution. You may not be able to increase the resolution above a certain level. Only the recommended screen resolutions are listed.

For additional settings, click the **Advanced** button on the **Settings** tab, click the **Adapter** tab, and then click **List all Modes**. Select the resolution, color level, and refresh rate.

Accessing Additional Functions With the Advanced Button

The **Advanced** button on the **Settings** tab of the **Display Properties** window allows you to access a variety of additional control features to adjust the computer display. You can also click the **Troubleshoot** button to resolve specific display problems.

Accessing the Video Card Control Features

For additional features and settings, click **Advanced**. From the **Advanced** tab, select the tab specific for the video card installed in your computer.

If the video resolution setting is higher than that supported by the display, the computer enters pan mode. In pan mode, the entire screen cannot be displayed at one time. For example, the taskbar that usually appears at the bottom of the desktop may no longer be visible. To view the rest of the screen, use the touch pad or track stick to pan up, down, left, and right.

NOTICE: You can damage an external monitor by using an unsupported refresh rate. Before adjusting the refresh rate on an external monitor, see the *User's Guide* for the monitor.

Getting Help for Video Display Resolution Problems

For information about setting display properties through the Windows **Display Properties** menu, see Windows Help and Support.

For help with specific problems, click the **Troubleshoot** button from the **Settings** tab. This action takes you to the Video Display Troubleshooter in Windows Help and Support.

Depending on the video card installed in your computer, your computer may have a special video control panel with extensive help information. The video card control panel may also provide special wizard software to enable the TV display option, along with custom display settings.

Some video card vendors provide:

- Video card control panels
- Detailed help guides
- Context sensitive help
- Display settings wizards
- TV settings wizards

Adjusting Display Settings With the Vendor Video Card Control Panel

The preferred method for adjusting display settings, such as screen resolution and color, is through the video card control panel. The control panel supplies the vendor's recommended settings.

NOTE: If you use the Windows **Display Properties** menu for adjusting display settings, these settings may conflict with the vendor default settings and cause unanticipated results.

Windows Vista

1. Right-click an open area of the desktop.
2. Click **Personalize**. The **Personalize appearance and sounds** window appears.
3. Click **Display Settings**→ **Advanced Settings**.
4. Click the tab for the video card installed in your computer. This tab will display the manufacturer's name for the video card.

Windows XP

1. Access the **Display Properties** menu through the **Control Panel**.
2. Click the **Settings** tab.
3. Click **Advanced**.

4 Click the tab for the video card installed in your computer. This tab will display the manufacturer's name for the video card.

FOR MORE INFORMATION: To learn more about the video card installed in your computer, see Windows Help and Support: click **Start** or → **Help and Support**.

When you click the tab for the specific video card, the appropriate video card control panel is displayed. For example, if the computer has an Nvidia video card, the Nvidia Control Panel is displayed.

The left side of the **Video Card Control Panel** screen provides detailed help information for using the control panel features.

Using the Wizards

Special wizards may be available with the TV or the video card control panel to help you enable your TV as a display device and set the display options:

- TV wizard
- Video card wizard

Using a Video Card Wizard to Configure Display Settings

Depending on the video card installed in your computer, the video control panel may provide a special display wizard to enable the TV display option, along with custom display settings. For example, to access a Multiple Displays Wizard for Nvidia:

Windows Vista

1 Right-click an open area of the desktop.

2 Click **Personalize**. The **Personalize appearance and sounds** window appears.

3 Click **Display Settings**→ **Advanced Settings**.

4 Click the tab for the Nvidia video card.

5 Launch the Nvidia Control Panel.

6 From the **Select a Task** menu, select the **Display** category.

Windows XP

1 Access the **Display Properties** menu through the **Control Panel**.
2 Click the **Settings** tab.
3 Click **Advanced**.
4 Click the tab for the Nvidia video card.
5 Launch the Nvidia Control Panel.
6 From the **Select a Task** menu, select the **Display** category.

The Nvidia Control Panel shows the **Display** menu. If you have the connection to your TV set up correctly, the wizard for **Multiple Displays** is available.

Select the **Run multiple display wizard** option to configure your desired computer and TV display settings.

For information about the video card wizard, see the help information that is available with the video card control panel.

> **EXAMPLE:** The Nvidia Multi-Display Setup Wizard takes you through selections for resolutions and desktop setup. See the detailed help information available through the Nvidia Control Panel.

Using a TV Wizard to Configure Display Settings

The video card control panel may also offer a TV wizard to help you configure the settings for your TV.

> **EXAMPLE:** The Nvidia Control Panel offers a Television Setup Wizard. For information about the Television Setup Wizard, see the Control Panel Help.

Many televisions provide a wizard that runs automatically when the TV has been successfully detected as an additional display device. See the documentation that came with your TV for information about the TV wizard.

Getting Help for Video Card Control Panels

Depending on the video card installed in your computer, your computer may have a special video card control panel with extensive help information.

> **EXAMPLE:** The Nvidia Control Panel provides an example of the help that is available. For information about the topics displayed, click on **Help Contents** shown on the left of the screen. You can also select a category and click on the **Help Contents** for that category.

For more information, see the section of Windows Help and support for user's guides and device guides.

Troubleshooting Display Settings

Where to Find Help

If your computer or TV shows no display or has other display problems, you can find help from a variety of sources:

- Television user's guide
- Television Menu Help
- Documentation shipped with your computer
- Microsoft Windows Help and Support for display properties
- Video-card control panel troubleshooting

  Depending on the video card installed in your computer, your computer may have a special video card control panel with extensive help information.

Resolving Common Problems

Computer Does not Recognize the TV as a Display Device

1. Turn off the TV.
2. Turn off the computer.
3. Disconnect the video cable from the TV and computer.

4 After ensuring that you are using the correct connectors on the back of the TV and the computer, reconnect the video cable to the computer and the TV.

5 Turn on the TV and the computer.

The TV should be shown as a display device on the **Display Properties** menu.

TV Resolution is Blurry

Use the control panel for the video card vendor to set the display resolution. This method provides the best coordination for video card and TV display resolution.

TV Colors are not True

Use the control panel for the video card vendor to adjust color settings. This method provides the best coordination for video card and TV display.

Use this same control panel to adjust display resolution.

17

Security and Privacy



Protecting Your Computer—Using Administrator Rights, User Groups, and Passwords

The Microsoft® Windows® operating system has security features such as administrator passwords and user passwords that let you control access to your computer and the information stored on your computer.

Administrator Rights

An administrator can make system-wide changes to the computer, change security settings, install software, and access all files on the computer. A person with a computer administrator account has full access to other user accounts on the computer.

EXAMPLE: If more than one person in your office uses the same computer, administrator rights allow you to ensure that security and other computer settings remain the same and that confidential data is not accessed.

EXAMPLE: If several family members, including children, share a home computer, you can, as administrator, limit the information your children have access to and the programs they can install.

FOR MORE INFORMATION: To learn more about administrator rights, see Windows Help and Support: click **Start** or → **Help and Support.**

Setting Access Permissions on Folders or Files

1. Log in to your computer as administrator.
2. Locate the folder or file for which you want to set permissions and right-click on it.
3. Click **Properties**→ **Security**.
4. In the **Security** tab, add a group/user or change or remove permissions from an existing group.

User Groups

As an administrator, you can restrict a user's access to your computer by changing that user's group to a restricted user group.

A user who is part of the restricted user group can operate the computer and save documents, but cannot install programs or change system settings.

EXAMPLE: If more than one person in your office shares a computer, each user can be assigned her own account with user permissions.

EXAMPLE: If several family members share a home computer, each person can be assigned to his own account, with restrictions placed on the information each user can access.

Changing a User Account or Group

To assign a user to a group or change a user's group, log in as administrator and access **User Account** through the **Control Panel**.

FOR MORE INFORMATION: To learn more about assigning users to groups, see Windows Help and Support: click **Start** or → **Help and Support.**

NOTE: Some operating systems allow you to choose which hours your children can use the computer by setting the hours allowed for each day of the week and blocking all the rest. You can also view activity reports to see how much each person uses the computer. To see if your operating system includes a parental control device, check the folders or links on your Control Panel, or search Windows Help and Support on your computer.

Passwords

Anyone can log on to your computer and access your files unless it is protected by a password. If you are logged on to your computer as an administrator, you can create a password for any user account.

Passwords can be used to protect your computer in a variety of ways and levels of protection. You can apply passwords to files, as well as to your computer.

Passwords with at least a 10-character combination that includes alphabetic, numeric, and special characters adds a level of security to your computer.

Using Secure Passwords

A secure password is an important way to protect your computer from unauthorized users who may install malicious software or access confidential files from your computer. The stronger your password, the more likely it will prevent your computer from attacks.

A strong password:

- Contains both uppercase and lowercase letters
- Contains a combination of numbers, words, and/or symbols
- Is changed on a regular basis

FOR MORE INFORMATION: To learn more about creating secure passwords, see Windows Help and Support: click **Start** or → **Help and Support**.

Smart Cards

NOTE: The smart card feature may not be available on your computer.

Smart cards are laptop credit-card shaped devices with internal integrated circuits. Using smart cards can improve system security by combining something a user has (the smart card) with something only the user should know (a PIN) to provide more secure user-authentication than passwords alone. There are two main types of Smart Cards:

- **Contact Smart Cards** — These cards have a contact area with many gold plated connection pads. When inserted into a card reader, the information from the chip can be read and written.
- **Contactless Smart Cards** — These cards do not require any physical contact with the reader. The chip communicates with the card reader through RFID induction technology. These cards require only close proximity to an antenna of a card reader to complete transaction.

Fingerprint Readers

NOTE: The fingerprint reader may not be available on your computer.

A fingerprint reader is a peripheral device for your computer with a strip sensor. When you slide your finger over the reader, the reader uses your unique fingerprint to authenticate your user identity and helps keep your Dell computer secure.

Facial Recognition Software

NOTE: The facial recognition software may not be available on your computer.

Using a digital image from the camera in your computer, the facial recognition software can identify or verify your face. This is done by comparing select facial features from the image and a facial database. On verification of your identity, the software allows you to access your computer without entering the password.

Using a Firewall to Secure Your Computer

Use a firewall to secure your computer from non-authorized users (hackers) or from malicious programs, such as viruses or worms. Firewalls also help to prevent your computer from spreading malicious programs to other computers.

Turning On Windows Firewall

For Windows Vista®

1 Click **Start** → **Control Panel**→ **Security**→ **Windows Firewall**.

For Windows® XP

Click **Start** → **Control Panel**→ **Security Center**→ **Windows Firewall**.

2 Turn the **Windows Firewall** on or off. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

3 Click **On (recommended)**, and then click **OK**.

HINT: You must be logged on to this computer as an administrator to turn on Windows Firewall.

FOR MORE INFORMATION: To learn more about firewalls, see "Windows Firewall: recommended links" in Windows Help and Support: click **Start** or → **Help and Support**. Also, see "Firewalls" on page 180.

Encrypting Files and Folders

Encryption is an additional method you can use to protect your files and folders. Encrypted files and folders can only be viewed or accessed by users with proper permissions.

1. Right-click the folder or file you want to encrypt, and then click **Properties**.
2. On the **General** tab, click **Advanced**.
3. Select the **Encrypt contents to secure data** check box, and then click **OK**.

FOR MORE INFORMATION: To learn more about encryption, see "Encryption: recommended links" in Windows Help and Support: click **Start** or → **Help and Support**.

Using Antivirus Software

By using an antivirus software program, you can protect your computer from computer viruses. Computer viruses can infect your computer, damage your files, make your computer vulnerable to additional attacks, and cause your computer to spread viruses to other computers. Computer viruses can be sent through e-mail or through downloaded programs.

For a list of compatible antivirus software programs, visit the Microsoft Catalog at the Microsoft website (**microsoft.com**).

Maintaining Security When Using a Public Wireless Network

Generally, two types of security are used for public wireless network:

- Security-enabled — A security-enabled connections offers some protection for your computer and the information it contains.
- Unsecured — An unsecured network leaves your computer vulnerable to attacks or other security risks.

As a rule of thumb, you should avoid using unsecured public wireless network.

You will know if the wireless public network that you select is secure if a network key is requested. If the network you choose is security-enabled, one of the following occurs:

- If the network key is automatically provided by your system administrator, the connection is made automatically.
- If the network key is not automatically provided, obtain the key and type it in the network key data box.

> **FOR MORE INFORMATION:** To learn more about using public wireless networks, see the following topics in Windows Help and Support: click **Start** or → **Help and Support**.
>
> - To find a public wireless network location
> - Manually add a wireless network to the Preferred Networks list
> - Connect to an available wireless network
> - To determine if your computer has a firewall
> - Help protect your computer

Reducing the Risk of Getting Computer Viruses

- Install an antivirus program
- Avoid opening suspicious e-mails or e-mail attachments
- Update Windows on a regular basis
- Use a firewall

FOR MORE INFORMATION: To learn more about viruses and how to protect against them, see the following topics in Windows Help and Support: click **Start** or → **Help and Support**.

- How do I remove a computer virus?
- How can I tell if my computer has a virus?

Dealing With Cookies

Cookies are used by websites to personalize your viewing experience. For instance, a cookie can save your password information so that you only have to enter it the first time you visit a website.

However, some cookies may use this personal information for other reasons, putting your privacy at risk.

FOR MORE INFORMATION: To learn more about cookies, see "Maintaining Privacy by Blocking and Deleting Cookies" on page 189.

Blocking all Cookies

1 Open Internet Explorer®.

2 Click the **Tools** menu, and then click **Internet Options**.

3 Click the **Privacy** tab, and then, under **Settings**, move the slide bar to the desired security setting, and then click **OK**.

HINT: Blocking cookies might prevent some web pages from displaying correctly. Some websites store your member name, password, or other information about you in a cookie. If you delete that cookie, you may have to enter your personal information again the next time you visit the site.

Avoiding Spyware and Malware

Spyware and malware are types of computer programs that can potentially harm your computer and make the information it contains vulnerable to security risks. There are many ways to prevent spyware and malware from infecting your computer. For example, you can use anti-virus software to secure, check, and/or clean up your computer from these forms of malicious software.

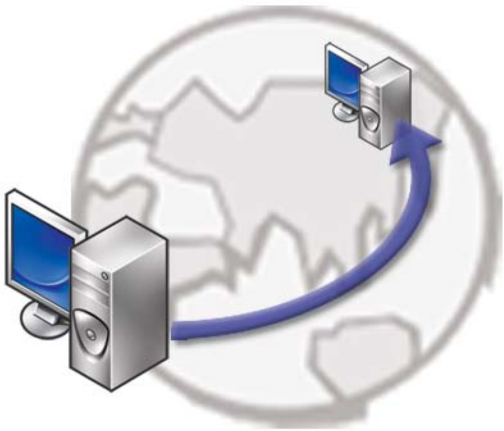
For a list of compatible anti-spyware and anti-malware software programs, visit the Microsoft Catalog at the Microsoft website (**microsoft.com**).

FOR MORE INFORMATION: To learn more about spyware and malware, see "Spyware and Malware" on page 182. Also, see the following topics in Windows Help and Support: click **Start** or → **Help and Support**

- Remove spyware from your computer
- Using anti-malware software to help protect your computer
- When to trust a website

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Microsoft®Windows® XP Pro Remote Desktop



Remote Desktop provides access from a remote location to a computer running the Microsoft Windows XP Professional operating system, enabling you to work on your computer from anywhere, anytime.

Enabling Remote Desktop on the Host Computer

Before using Remote Desktop, you must enable the Remote Desktop feature on the host computer so that you can control it remotely from another computer.

You must be logged on as administrator to enable Remote Desktop.

To set up the host computer, you need:

- Microsoft Windows XP Professional must be installed on the computer containing the files and programs that you want to access from a remote computer.

- The host computer must be part of a network in which Remote Desktop connections are permitted.
- The remote computer must be running a compatible version of Microsoft Windows and must be connected to the Internet or on a local area network.
- The remote computer must have the Remote Desktop Connection client software installed. The remote computer is called the client.
- Both computers must be connected to the Internet through a Virtual Private Network (VPN).
- Appropriate user accounts and permissions configured on the remote Windows XP Professional host to allow remote access.

If your client computer is not connected to the host computer through a VPN, you need to use the actual IP address of the host computer instead of the computer name.

Installing Remote Desktop Client Software

The Remote Desktop Client software is installed by default on computers running Windows XP.

Calling From a Remote Location

1. Use the public IP address, as assigned by the ISP, or fully qualified domain name of the computer or router/NAT/firewall.

   If the firewall/NAT/router is configured correctly, the call will be successfully passed to the appropriate computer.

2. If the ISP assigns a dynamic IP address, then another solution is to set up an account with one of the dynamic naming services that map a fully qualified domain name to the IP.

EXAMPLE: Some remote users take advantage of a free service from No-IP.com.

The No-IP.com software runs on the client computer and on a time schedule basis contacts the No-IP.com servers. The No-IP.com servers then know what the IP address is and maps that address to a fully qualified domain name.

That information is then propagated over the public Internet. Then the remote user calls the Remote Desktop host computer using the fully qualified domain name.

FOR MORE INFORMATION: To learn more about using the Remote Desktop feature, see "Windows XP Pro Remote Desktop configuration, use, and troubleshooting tips" in your Windows XP Professional Resource Kit.

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Restoring Your Operating System

You can restore your operating system in the following ways:

- System Restore returns your computer to an earlier operating state without affecting data files. Use System Restore as the first solution for restoring your operating system and preserving data files.
- Dell PC Restore by Symantec (available in Windows XP) and Dell Factory Image Restore (available in Windows Vista) returns your hard drive to the operating state it was in when you purchased the computer. Both permanently delete all data on the hard drive and remove any programs installed after you received the computer. Use Dell PC Restore or Dell Factory Image Restore only if System Restore did not resolve your operating system problem.
- If you received an *Operating System* disc with your computer, you can use it to restore your operating system. However, using the *Operating System* disc also deletes all data on the hard drive. Use the disc *only* if System Restore did not resolve your operating system problem.

Using Microsoft® Windows® System Restore

The Windows operating systems provide a System Restore option which allows you to return your computer to an earlier operating state (without affecting data files) if changes to the hardware, software, or other system settings have left the computer in an undesirable operating state. Any changes that System Restore makes to your computer are completely reversible.

NOTICE: Make regular backups of your data files. System Restore does not monitor your data files or recover them.

NOTE: The procedures in this document were written for the Windows default view, so they may not apply if you set your Dell™ computer to the Windows Classic view.

Starting System Restore

NOTICE: Before you restore the computer to an earlier operating state, save and close any open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

Windows Vista®

1 Click **Start** .

2 In the **Start Search** box, type `System Restore` and press <Enter>.

NOTE: The **User Account Control** window may appear. If you are an administrator on the computer, click **Continue**; otherwise, contact your administrator to continue the desired action.

3 Click **Next** and follow the remaining prompts on the screen.

In the event that System Restore did not resolve the issue, you may undo the last system restore.

Windows® XP

1 Click **Start** → **All Programs**→ **Accessories**→ **System Tools**→ **System Restore**.

2 Click either **Restore my computer to an earlier time** or **Create a restore point**.

3 Click **Next** and follow the remaining on-screen prompts.

Undoing the Last System Restore

NOTICE: Before you undo the last system restore, save and close all open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

Windows Vista

1 Click **Start** .

2 In the **Start Search** box, type `System Restore` and press <Enter>.

3 Click **Undo my last restoration** and click **Next**.

Windows XP

1 Click **Start** → **All Programs**→ **Accessories**→ **System Tools**→ **System Restore**.

2 Click **Undo my last restoration** and click **Next**.

Enabling System Restore

NOTE: Windows Vista does not disable System Restore; regardless of low disk space. Therefore, the steps below apply only to Windows XP.

If you reinstall Windows XP with less than 200 MB of free hard-disk space available, System Restore is automatically disabled.

To see if System Restore is enabled:

Windows Vista

1 Click **Start** → **Control Panel**→ **System and Maintenance**→ **System**.

2 In the left pane, click **System Protection**.

3 Click the **System Protection** tab. Ensure that the **System Protection** for the hard disk is unchecked under **Automatic restore points**.

Windows XP

1 Click **Start** → **Control Panel**→ **Performance and Maintenance**→ **System**.

2 Click the **System Restore** tab and ensure that **Turn off System Restore** is unchecked.

Using Dell™ PC Restore and Dell Factory Image Restore

NOTICE: Using Dell PC Restore or Dell Factory Image Restore permanently deletes all data on the hard drive and removes any programs or drivers installed after you received your computer. If possible, back up the data before using these options. Use PC Restore or Dell Factory Image Restore only if System Restore did not resolve your operating system problem.

NOTE: Dell PC Restore by Symantec and Dell Factory Image Restore may not be available in certain countries or on certain computers.

Use Dell Factory Image Restore (Windows Vista) or Dell PC Restore (Windows XP) only as the last method to restore your operating system.

These options restore your hard drive to the operating state it was in when you purchased the computer. Any programs or files added since you received your computer—including data files—are permanently deleted from the hard drive. Data files include documents, spreadsheets, e-mail messages, digital photos, music files, and so on. If possible, back up all data before using PC Restore or Factory Image Restore.

Windows Vista: Dell Factory Image Restore

1. Turn on the computer. When the Dell logo appears, press <F8> several times to access the **Vista Advanced Boot Options** window.
2. Select **Repair Your Computer**.

   The **System Recovery Options** window appears.
3. Select a keyboard layout and click **Next**.
4. To access the recovery options, log on as a local user. To access the command prompt, type `administrator` in the User name field, then click **OK**.
5. Click **Dell Factory Image Restore**.

   NOTE: Depending upon your configuration, you may need to select **Dell Factory Tools**, then **Dell Factory Image Restore**.

   The **Dell Factory Image Restore** welcome screen appears.
6. Click **Next.**

The **Confirm Data Deletion** screen appears.

NOTICE: If you do not want to proceed with Factory Image Restore, click **Cancel**.

7. Click the check box to confirm that you want to continue reformatting the hard drive and restoring the system software to the factory condition, and then click **Next**.

   The restore process begins and may take five or more minutes to complete. A message appears when the operating system and factory-installed applications have been restored to factory condition.
8. Click **Finish** to reboot the system.

Using the Operating System Media

Before you Begin

If you are considering reinstalling the Windows operating system to correct a problem with a newly installed driver, first try using Windows Device Driver Rollback. See "Determining Whether a Device Driver is the Source of a Device Problem" on page 79. Then try Device Driver Rollback (see "Replacing a Driver With a Previous Version of the Driver" on page 79).

If Device Driver Rollback does not resolve the problem, then use System Restore to return your operating system to the operating state it was in before you installed the new device driver (see "Using Microsoft® Windows® System Restore" on page 265).

NOTICE: Before performing the installation, back up all data files on your primary hard drive. For conventional hard drive configurations, the primary hard drive is the first drive detected by the computer.

To reinstall Windows, you need the following items:

- Dell™ *Operating System* media
- Dell *Drivers and Utilities* media

NOTE: The Dell *Drivers and Utilities* media contains drivers that were installed during the assembly of the computer. Use the Dell *Drivers and Utilities* media to load any required drivers. Depending on the region from which you ordered your computer, or whether you requested the media, the Dell *Drivers and Utilities* media and *Operating System* media may not ship with your computer.

Reinstalling Windows XP or Windows Vista

The reinstallation process can take 1 to 2 hours to complete. After you reinstall the operating system, you must also reinstall the device drivers, virus protection program, and other software.

NOTICE: The *Operating System* media provides options for reinstalling Windows XP. The options can overwrite files and possibly affect programs that are installed on your hard drive. Therefore, do not reinstall Windows XP unless a Dell technical support representative instructs you to do so.

1 Save and close any open files and exit any open programs.

2 Insert the *Operating System* disc.

3 Click **Exit** if the `Install Windows` message appears.

4 Restart the computer.

When the DELL logo appears, press <F12> immediately.

NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop; then, shut down your computer and try again.

NOTE: The next steps change the boot sequence for one time only. On the next start-up, the computer boots according to the devices specified in the system setup program.

5 When the boot device list appears, highlight **CD/DVD/CD-RW Drive** and press <Enter>.

6 Press any key to **Boot from CD-ROM**.

7 Follow the instructions on the screen to complete the installation.

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Troubleshooting



HINT: Save time by following these basic tips when troubleshooting your computer.

1 If you added or removed a part before the problem started, review the installation procedures and ensure that the part is correctly installed.
2 If a peripheral device does not work, ensure that the device is properly connected.
3 If an error message appears on the screen, write down the exact message. This message may help support personnel diagnose and fix the problem(s).
4 If an error message occurs in a program, see the program's documentation.

NOTE: The procedures in this document were written for the Windows default view, and may not apply if you set your Dell computer to the Windows Classic view.

Troubleshooting Tools

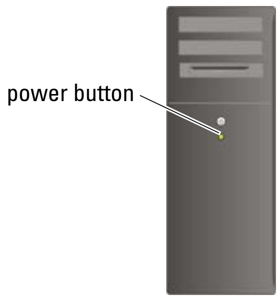
Some of the troubleshooting tools you may need to diagnose and resolve problems on your computer include:

Tool	Function
Power lights	The power button light illuminates and blinks or remains solid to indicate different power states, such as power, no power, or standby. This light can also indicate internal power problems. See your *Service Manual* for information about power lights.
Diagnostic lights for desktop computers	Some desktop computers have diagnostic lights. These lights function in conjunction with the power lights. These lights start and turn off or light in a certain sequence to indicate status and problems. See your *Service Manual* for information about diagnostic lights.
Diagnostic lights for laptop computers	Keyboard status lights indicate status and any problems. See your *Service Manual* for information about diagnostic and status lights.
System messages	Your desktop or laptop computer may display messages indicating errors or problems, which need to be resolved. Write down the information displayed on the screen and look for the message in the System Messages list or in your *Service Manual* for information on how to resolve the problem.
Windows Hardware Troubleshooter	Use the Hardware Troubleshooter to resolve device configuration, compatibility problems, or operating status.
Dell Diagnostics	With the Dell Diagnostics, the computer runs the Pre-boot System Assessment (PSA), a series of initial tests of your system board, keyboard, display, memory, hard drive, etc. Dell Diagnostics can also be used to run a more complete system test to evaluate your computer.

Dell Support Utility	Use this support utility for self-support information, software updates, and health scans of your computing environment.

Power Lights for Desktop Computers

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.



The power button light located on the front of the computer illuminates and blinks or remains solid to indicate different states:

- If the power light is blue and the computer is not responding, see the *Service Manual* for your computer.

NOTE: On certain systems the power light is green.

- If the power light is blinking blue, the computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.

NOTE: On certain systems the power light is green.

- If the power light is off, the computer is either turned off or is not receiving power.
  - Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
  - If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on.

- Replace power protection devices, power strips, and power extension cables with similar products in known working condition to verify that the computer turns on properly.
- Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
- Ensure that the main power cable and front panel cable are securely connected to the system board (see the *Service Manual* for your computer).

• If the power light is blinking amber, the computer is receiving electrical power, but an internal power problem may exist.
  - Ensure that the voltage selection switch is set to match the AC power at your location, if applicable.
  - Ensure that the processor power cable is securely connected to the system board (see the *Service Manual* for your computer).
• If the power light is steady amber, a device may be malfunctioning or incorrectly installed.
  - Remove and then reinstall the memory modules (see the documentation shipped with your computer).
  - Remove and then reinstall any cards (see the documentation shipped with your computer).
• Eliminate interference. Some possible causes of interference are:
  - Power, keyboard, and mouse extension cables
  - Too many devices on a power strip
  - Multiple power strips connected to the same electrical outlet

Diagnostic Lights for Desktop Computers

Some desktop computers have lights labeled with numbers on the front panel. When the computer starts normally, the lights flash, and then turn off.

If the computer malfunctions, the sequence of the lights can be used to help identify the problem.

FOR MORE INFORMATION: To learn more about the meaning of the various diagnostic lights displayed, see the *Service Manual* for your computer or search for the topic on the Dell Support website **support.dell.com**.

Diagnostic Lights for Laptop Computers

Typically laptop computers have keyboard status lights located above the keyboard. See the documentation shipped with your computer for more details.

During normal operation, the keyboard status lights display the current status of certain features. If the computer malfunctions, you can use the status of the lights to help identify the problem.

FOR MORE INFORMATION: to learn more about the meaning of the various keyboard status lights displayed, see the *Service Manual* for your computer or search for the topic on the Dell Support website **support.dell.com**.

System Messages for Desktop Computers

NOTE: If the message you received is not listed in the table, see the documentation for either the operating system or the program that was running when the message appeared.

ALERT! PREVIOUS ATTEMPTS AT BOOTING THIS SYSTEM HAVE FAILED AT CHECKPOINT [NNNN]. FOR HELP IN RESOLVING THIS PROBLEM, PLEASE NOTE THIS CHECKPOINT AND CONTACT DELL TECHNICAL SUPPORT — The computer failed to complete the boot routine three consecutive times for the same error (see "Contacting Dell" on page 337 for assistance).

CMOS CHECKSUM ERROR — Possible motherboard failure or RTC battery low. Replace the battery (see the documentation shipped with your computer or see "Contacting Dell" on page 337 for assistance).

CPU FAN FAILURE — CPU fan failure. Replace the CPU fan (see the *Service Manual* for your computer).

HARD-DISK READ FAILURE — Possible HDD failure during HDD boot test (see "Contacting Dell" on page 337 for assistance).

KEYBOARD FAILURE — Keyboard failure or keyboard cable loose (see "Keyboard Problems for External Keyboards" on page 292).

NO BOOT DEVICE AVAILABLE — The system cannot detect a bootable device or partition.

- If the optical drive is your boot device, ensure that the cables are connected and that a bootable optical media is in the drive.
- If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device.
- Enter the system setup program and ensure that the boot sequence information is correct (see "System Setup" on page 307).

NO TIMER TICK INTERRUPT — A chip on the system board might be malfunctioning or the system board itself may have a failure (see "Contacting Dell" on page 337 for assistance).

NOTICE – HARD DRIVE SELF MONITORING SYSTEM HAS REPORTED THAT A PARAMETER HAS EXCEEDED ITS NORMAL OPERATING RANGE. DELL RECOMMENDS THAT YOU BACK UP YOUR DATA REGULARLY. A PARAMETER OUT OF RANGE MAY OR MAY NOT INDICATE A POTENTIAL HARD DRIVE PROBLEM. — S.M.A.R.T error, possible HDD failure. This feature can be enabled or disabled in BIOS setup.

System Messages for Laptop Computers

NOTE: If the message you received is not listed in the table, see the documentation for either the operating system or the program that was running when the message appeared.

DECREASING AVAILABLE MEMORY — See "Lockups and Software Problems" on page 292.

ERROR 8602 – AUXILIARY DEVICE FAILURE VERIFY THAT MOUSE AND KEYBOARD ARE SECURELY ATTACHED TO CORRECT CONNECTORS.

FLASH PART WRITE PROTECTED ERROR — Contact Dell (see "Contacting Dell" on page 337).

GATE A20 FAILURE — See "Lockups and Software Problems" on page 292.

INVALID CONFIGURATION INFORMATION - PLEASE RUN SETUP PROGRAM — Enter the system setup program (see "Entering the System Setup Program" on page 308) and change the system setup program options (see "Working With Options on the System Setup Program Screen" on page 308) to correct the configuration error.

KEYBOARD FAILURE — Keyboard failure or keyboard cable loose (see "Keyboard Problems for External Keyboards" on page 292).

MEMORY ADDRESS LINE FAILURE AT (ADDRESS), READ VALUE EXPECTING

(VALUE) — See "Lockups and Software Problems" on page 292.

MEMORY DOUBLE WORD LOGIC FAILURE AT (ADDRESS), READ VALUE EXPECTING (VALUE) — See "Lockups and Software Problems" on page 292.

MEMORY ODD/EVEN LOGIC FAILURE AT (ADDRESS) READ VALUE EXPECTING (VALUE) — See "Lockups and Software Problems" on page 292.

MEMORY WRITE/READ FAILURE AT (ADDRESS), READ VALUE EXPECTING (VALUE) — See "Lockups and Software Problems" on page 292.

MEMORY SIZE IN CMOS INVALID — See "Lockups and Software Problems" on page 292.

NO BOOT DEVICE AVAILABLE – STRIKE F1 TO RETRY BOOT, F2 FOR SETUP UTILITY. PRESS F5 TO RUN ONBOARD DIAGNOSTICS — The system cannot detect a bootable device or partition.

- If the optical drive is your boot device, ensure that the cables are connected and that a bootable optical media is in the drive.
- If the hard drive is your boot device, ensure that the drive is installed properly and partitioned as a boot device.
- Enter the system setup program and ensure that the boot sequence information is correct (see "Entering the System Setup Program" on page 308).

NO BOOT SECTOR ON HARD-DISK DRIVE — Enter the system setup program and ensure that the configuration information for the hard drive is correct (see "Entering the System Setup Program" on page 308).

NO TIMER TICK INTERRUPT — Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

POWER WARNING MESSAGES HAVE BEEN DISABLED. RUN THE SETUP UTILITY TO ENABLE THESE MESSAGES. — See "Entering the System Setup Program" on page 308.

READ FAILURE ON INTERNAL HARD DRIVE — See "Drive Problems" on page 287.

READ FAILURE ON SECOND INTERNAL HARD DRIVE — This message applies to notebook computers that support multiple hard drives. See "Drive Problems" on page 287.

RTC MODE FIXED – TIME AND DATE MAY BE WRONG — Enter the system setup program and correct the date or time (see "Entering the System Setup Program" on page 308). If the problem persists, replace the CMOS battery.

SHUTDOWN FAILURE — Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

TIME-OF-DAY CLOCK STOPPED – PLEASE RUN THE SYSTEM SETUP

PROGRAM — Enter the system setup program and correct the date or time (see "Entering the System Setup Program" on page 308). If the problem persists, replace the CMOS battery.

TIME-OF-DAY NOT SET – PLEASE RUN THE SYSTEM SETUP PROGRAM — Enter the system setup program and correct the date or time (see "Entering the System Setup Program" on page 308). If the problem persists, replace the CMOS battery.

TIMER CHIP COUNTER 2 FAILED — Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

THE AC POWER ADAPTER TYPE CANNOT BE DETERMINED. THE SYSTEM CAN ONLY BOOT WITH A 130-W POWER ADAPTER OR GREATER. STRIKE THE F1 KEY TO SHUTDOWN. — Connect a 130-W or greater AC adapter to the computer or docking station.

NOTE: This message concerning the requirement of an AC power adapter type of 130-W or greater applies to laptop computers that require a 130-W or greater AC adapter.

THE AC POWER ADAPTER WATTAGE AND TYPE CANNOT BE DETERMINED. THE BATTERY MAY NOT CHARGE. THEY SYSTEM WILL ADJUST THE PERFORMANCE TO MATCH THE POWER AVAILABLE. PLEASE CONNECT A DELL XXX-W AC ADAPTER OR GREATER FOR BEST SYSTEM PERFORMANCE. STRIKE THE F3 KEY (BEFORE THE F1 OR F2 KEY) IF YOU DO NOT WANT TO SEE POWER WARNING MESSAGES AGAIN. STRIKE THE F1 KEY TO CONTINUE, F2 TO RUN THE SETUP UTILITY. — Connect the correct AC adapter to the computer or docking station.

THE COMPUTER IS DOCKED AND ONLY BATTERY POWER IS DETECTED. THIS CAN HAPPEN IF THE POWER ADAPTER IS MISSING, THE POWER CORD IS UNPLUGGED, OR THE COMPUTER IS NOT PROPERLY CONNECTED TO THE DOCKING STATION. YOU SHOULD UNDOCK, REDOCK, ATTACH THE POWER ADAPTER, OR PLUG IN THE POWER CORD. STRIKE THE F1 KEY TO SHUTDOWN.

THE AMOUNT OF SYSTEM MEMORY HAS CHANGED. IF YOU DID NOT CHANGE YOUR MEMORY... TO RESOLVE THIS ISSUE, TRY TO RESEAT THE MEMORY. STRIKE THE F1 KEY TO CONTINUE, F2 TO RUN THE SETUP UTILITY. PRESS F5 TO RUN ONBOARD DIAGNOSTICS. —

- Reseat the memory (for instructions, see your computer’s *Service Manual*).
- If memory was not removed or installed, memory module or system board failure may have occurred. Contact Dell for assistance (see "Contacting Dell" on page 337).

UNSUPPORTED MEMORY. STRIKE THE F1 KEY TO SHUTDOWN. — Ensure that the memory you are using is supported by your computer (see the documentation shipped with your computer).

WARNING: A XXX-W AC ADAPTER HAS BEEN DETECTED, WHICH IS LESS THAN

THE RECOMMENDED XXX-W AC ADAPTER ORIGINALLY SHIPPED. THIS WILL INCREASE THE TIME TO CHARGE THE BATTERY. THEY SYSTEM WILL ADJUST THE PERFORMANCE TO MATCH THE POWER AVAILABLE. PLEASE CONNECT A DELL XXX-W AC ADAPTER OR GREATER FOR BEST PERFORMANCE. STRIKE THE F3 KEY (BEFORE THE F1 OR F2 KEY) IF YOU DO NOT WANT TO SEE POWER WARNING MESSAGES AGAIN. STRIKE THE F1 KEY TO CONTINUE, F2 TO RUN THE SETUP UTILITY. —

Connect the correct AC adapter to the computer or docking station.

WARNING: THE PRIMARY BATTERY CANNOT BE IDENTIFIED. THIS SYSTEM WILL BE UNABLE TO CHARGE BATTERIES UNTIL THIS BATTERY IS REMOVED. — For computers with two batteries installed, the primary battery may be installed incorrectly, or the battery or system board may be defective.

WARNING: THE SECOND BATTERY CANNOT BE IDENTIFIED. THIS SYSTEM WILL BE UNABLE TO CHARGE BATTERIES UNTIL THIS BATTERY IS REMOVED. — For computers with two batteries installed, the secondary battery may be installed incorrectly, or the battery or system board may be defective.

WARNING: THE BATTERIES CANNOT BE IDENTIFIED. THIS SYSTEM WILL BE UNABLE TO CHARGE BATTERIES UNTIL THIS BATTERY IS REMOVED. — For computers with two batteries installed, one or more of the batteries may be installed incorrectly, or the batteries or system board may be defective.

WARNING: THE BATTERY CANNOT BE IDENTIFIED. THIS SYSTEM WILL BE UNABLE TO CHARGE THIS BATTERY. — The battery may be installed incorrectly, or the battery or system board may be defective.

WARNING: THE BATTERY ATTACHED CANNOT POWER THE SYSTEM. THE SYSTEM WILL NOT BOOT WITH THIS BATTERY PLUGGED IN. PRESS F1 TO SHUTDOWN THE SYSTEM.

WARNING! BATTERY IS CRITICALLY LOW. HIT F1 TO CONTINUE.

WARNING: THE TPM COULD NOT BE INITIALIZED — System board failure may have occurred. Contact Dell for assistance (see "Contacting Dell" on page 337).

WARNING MESSAGES HAVE BEEN DISABLED. RUN THE SETUP UTILITY TO ENABLE THESE MESSAGES. — See "System Setup" on page 307.

WARNING: DELL'S DISK MONITORING SYSTEM HAS DETECTED THAT DRIVE [0/1] ON THE [PRIMARY/SECONDARY] EIDE CONTROLLER IS OPERATING OUTSIDE OF NORMAL SPECIFICATIONS. IT IS ADVISABLE TO IMMEDIATELY BACK UP YOUR DATA AND REPLACE YOUR HARD DRIVE BY CALLING YOUR SUPPORT DESK OR DELL. — Contact Dell for assistance (see "Contacting Dell" on page 337).

YOUR POWER ADAPTER DOES NOT SUPPLY ENOUGH POWER TO RUN THE ATTACHED DOCKING STATION. EITHER UNDOCK OR INSERT AN APPROPRIATE ADAPTER. STRIKE THE F1 KEY TO SHUTDOWN. — Connect the correct AC adapter.

YOUR SYSTEM IS DOCKED, BUT THE AC ADAPTER TYPE CANNOT BE DETERMINED. EITHER UNDOCK OR INSERT AN APPROPRIATE ADAPTER. STRIKE THE F1 KEY TO SHUTDOWN. — The AC adapter may be installed incorrectly, or the AC adapter or docking station may be defective.

YOUR SYSTEM AUTOMATICALLY POWERED OFF BECAUSE IT BECAME WARMER THAN EXPECTED. THIS MAY HAVE BEEN CAUSED BY: OPERATING OR STORING THE SYSTEM IN AN ENVIRONMENT WHERE THE AMBIENT TEMPERATURE IS TOO HIGH, OR OBSTRUCTING THE AIR FLOW FROM THE SYSTEM FAN VENTS. IF THE PROBLEM RECURS, PLEASE CALL DELL SUPPORT WITH ERROR CODE #M1004. — Contact Dell for assistance (see "Contacting Dell" on page 337).

*****PROCESSOR SSDT DATA NOT FOUND*** OPERATING SYSTEM POWER MANAGEMENT FOR MULTI CORE PROCESSORS WILL BE DISABLED. —**

*****UL CIRCUIT TRIPPED*** THE UL TRIP COUNT IS SHOWN BELOW THE F3-KEY MESSAGE. STRIKE THE F3 KEY TO CLEAR THE UL COUNTER, ANY OTHER KEY TO CONTINUE. —** Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

*****PROCESSOR MICROCODE UPDATE FAILURE*** THE REVISION OF PROCESSOR IN THE SYSTEM IS NOT SUPPORTED. —** Ensure that the processor you are using is supported by your computer (see the documentation for your computer).

Windows Hardware Troubleshooter

If a device is either not detected during the operating system setup or is detected, but incorrectly configured, you can use the Hardware Troubleshooter to resolve the incompatibility.

1 Click **Start→ Help and Support**.

2 Type `hardware troubleshooter` in the search field and press <Enter> to start the search.

3 If the Help and Support window displays a **Fix a Problem** section, click **Hardware Troubleshooter**. Then select the option that best describes the problem.

   OR

4 In the search results, select the option that best describes the problem and follow the remaining troubleshooting steps.

Running the Dell Diagnostics

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTICE: The Dell Diagnostics works only on Dell™ computers.

When to use the Dell Diagnostics

If you experience a problem with your computer, see "Troubleshooting" on page 271 and run the Dell Diagnostics before you contact Dell for technical assistance.

It is recommended that you print these procedures before you begin.

See "System Setup" on page 307 to review your computer's configuration information, and ensure that the device that you want to test displays in the system setup program and is active.

Start the Dell Diagnostics from your hard drive or from the *Drivers and Utilities* media.

NOTE: The *Drivers and Utilities* media is optional and may not ship with your computer.

Starting the Dell Diagnostics From Your Hard Drive

The Dell Diagnostics is located on a hidden diagnostic utility partition on your hard drive.

Starting the Dell Diagnostics on Laptop Computers

NOTE: If your computer does not display a screen image, see "Contacting Dell" in the documentation shipped with your computer.

NOTE: If the computer is connected to a docking device (docked), undock it. See the documentation that came with your docking device for instructions.

1 Ensure that the computer is connected to an electrical outlet that is known to be working properly.

2 Turn on (or restart) your computer.

3 Start the Dell Diagnostics in one of the following two ways:

- When the DELL™ logo appears, press <F12> immediately. Select **Diagnostics** from the boot menu and press <Enter>.

NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop; then, shut down your computer and try again.

OR

- After the computer has been powered down completely, press and hold the <Fn> key while powering the computer on.

NOTE: If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from the *Drivers and Utilities* media.

The computer runs the Pre-boot System Assessment (PSA), a series of initial tests of your system board, keyboard, display, memory, hard drive, and so on.

- Answer any questions that appear.
- If failures are detected, write down the error code(s) and see "Contacting Dell" on page 337.

If the Pre-boot System Assessment completes successfully, the following message appears: "`Booting Dell Diagnostic Utility Partition. Press any key to continue`."

4 Press any key to start the Dell Diagnostics from the diagnostics utility partition on your hard drive.

5 When the Dell Diagnostics Main Menu appears, select the test you want to run.

6 Continue with "Using the Dell Diagnostics Main Menu" on page 284.

Starting the Dell Diagnostics on Desktop Computers

NOTE: If your computer cannot display a screen image, see "Contacting Dell" on page 337.

1 Ensure that the computer is connected to an electrical outlet that is known to be working properly.

2 Turn on (or restart) your computer.

3 When the DELL™ logo appears, press <F12> immediately. Select **Diagnostics** from the boot menu and press <Enter>.

NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop; then, shut down your computer and try again.

NOTE: If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from the *Drivers and Utilities* media.

4 Press any key to start the Dell Diagnostics from the diagnostics utility partition on your hard drive.

5 When the Dell Diagnostics Main Menu appears, select the test you want to run. See "Using the Dell Diagnostics Main Menu" on page 284.

6 Continue with "Using the Dell Diagnostics Main Menu" on page 284.

Starting the Dell Diagnostics From the *Drivers and Utilities* Media

1 Insert the *Drivers and Utilities* media.

2 Shut down and restart the computer.

When the DELL logo appears, press <F12> immediately.

NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop; then, shut down your computer and try again.

NOTE: The next steps change the boot sequence for one time only. On the next start-up, the computer boots according to the devices specified in the system setup program.

3 When the boot device list appears, highlight **CD/DVD/CD-RW** and press <Enter>.

4 Select the **Boot from CD-ROM** option from the menu that appears and press <Enter>.

5 Type `1` to start the CD menu and press <Enter> to proceed.

6 Select **Run the 32 Bit Dell Diagnostics** from the numbered list. If multiple versions are listed, select the version appropriate for your computer.

7 When the Dell Diagnostics **Main Menu** appears, select the test you want to run.

8 Continue with "Using the Dell Diagnostics Main Menu" on page 284.

Using the Dell Diagnostics Main Menu

1 After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

NOTE: Select **Test System** to run a complete test on your computer.

Option	Function
Test Memory	Run the stand-alone memory test
Test System	Run System Diagnostics
Exit	Exit the Diagnostics

2 After you have selected the **Test System** option from the main menu, the following menu appears:

NOTE: It is recommended that you select **Extended Test** from the menu below to run a more thorough check of devices on the computer.

Option	Function
Express Test	Performs a quick test of devices in the system. This typically can take 10 to 20 minutes.
Extended Test	Performs a thorough check of devices in the system. This typically can take an hour or more.
Custom Test	Used to test a specific device or customize the tests to be run.
Symptom Tree	Allows you to select tests based on a symptom of the problem you are having. This option lists the most common symptoms.

3 If a problem is encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description and see "Contacting Dell" on page 337.

NOTE: The Service Tag for your computer is located at the top of each test screen. If you contact Dell, technical support will ask for your Service Tag.

4 If you run a test from the **Custom Test or Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.
Configuration	Displays your hardware configuration for the selected device. The Dell Diagnostics obtains configuration information for all devices from system setup, memory, and various internal tests, and it displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

5 When the tests are complete, close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

6 Remove the Dell *Drivers and Utilities* media (if applicable).

Dell Support Center

The Dell Support Center application is installed on your computer and available from the Dell Support Center icon on the taskbar or from the **Start** button.

The software automatically identifies your Service Tag Number, PC Model Number, Express Service Code, your Warranty Information and provides you with support options for your computer such as drivers and downloads, training, tutorials, and Knowledge Base articles. The application also provides you with options for contacting Dell Technical Support including live chat, phone and E-mail.

Accessing the Dell Support Center

Access the Dell Support Center from the icon on the taskbar or from the **Start** menu.

NOTE: If the Dell Support Center is not available from the **Start** menu, go to **support.dell.com** and download the software.

The Dell Support Center application is customized for your computing environment.

The icon in the taskbar functions differently when you click, double-click, or right-click the icon.

Clicking the Dell Support Center Icon

Click or right-click the icon to access:

- Dell Support Center.
- Dell Support Center Alerts.
- Dell Support Center User Settings.
- Learn more about the Dell Support Center.

Double-Clicking the Dell Support Center Icon

Double-click the icon to open the home page to access:

- **Self Help** — Click to identify and fix problems with your computer.
- **Assistance From Dell** — Click to contact Dell about your computer problems or order status.
- **Alerts** — Click to view alerts from Dell for your computer.
- **About Your System** — Click to access information and documentation for your computer.
- **Drivers & Downloads** — Click to access drivers and downloads for your computer.
- **Dell Datasafe™ Online Backup** — Click to access online backup and recovery service offered by Dell for your computer.
- **ContactUs** — Click to access multiple options for contacting Dell.
- **Feedback** — Click to provide your feedback for Dell Support Center application.

Solving Problems

Battery Problems

CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

REPLACE THE BATTERY — If you have to repeatedly reset time and date information after turning on the computer, or if an incorrect time or date displays during start-up, replace the battery (see the instructions that came with your computer). If the battery still does not work properly, contact Dell (see "Contacting Dell" on page 337).

Drive Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

ENSURE THAT MICROSOFT® WINDOWS® RECOGNIZES THE DRIVE —

Windows Vista®

- Click **Start** → and click **Computer**.

  If the drive is not listed, see your *Service Manual* or contact Dell (see "Contacting Dell" on page 337).

Windows® XP

- Click **Start** → and **click My Computer**.

TEST THE DRIVE —

- Insert another disc to eliminate the possibility that the original drive is defective.

CLEAN THE DRIVE OR DISK — See "Maintenance Tasks (Enhance Performance and Ensure Security)" on page 125.

CHECK THE CABLE CONNECTIONS

FOR DRIVES WITH SPINDLES AND/OR TRAYS, ENSURE THAT THE MEDIA IS SNAPPED ONTO THE SPINDLE

FOR DRIVES THAT USE SLOT-LOADING, ENSURE THAT THE MEDIA IS COMPLETELY IN THE SLOT

RUN THE DELL DIAGNOSTICS — See your computer's *Documentation* and see "Running the Dell Diagnostics" on page 281.

Optical Drive Problems

RUN THE HARDWARE TROUBLESHOOTER — See "Windows Hardware Troubleshooter" on page 280.

RUN THE DELL DIAGNOSTICS — See "Running the Dell Diagnostics" on page 281.

Optical Drive Problems

NOTE: High-speed optical drive vibration is normal and may cause noise, which does not indicate a defect in the drive or the media.

NOTE: Because of different regions worldwide and different disc formats, not all DVD titles work in all DVD drives.

ADJUST THE WINDOWS VOLUME CONTROL —

- Click the speaker icon in the lower-right corner of your screen.
- Ensure that the volume is turned up by clicking the slide bar and dragging it up.
- Ensure that the sound is not muted by clicking any boxes that are checked.

CHECK THE SPEAKERS AND SUBWOOFER — See "Sound and Speaker Problems" on page 299.

Problems Writing to an Optical Drive

CLOSE OTHER PROGRAMS — The optical drive must receive a steady stream of data during the writing process. If the stream is interrupted, an error occurs. Try closing all programs before you write to the optical.

TURN OFF STANDBY MODE IN WINDOWS BEFORE WRITING TO A DISC — See "Configuring Your Power Settings" on page 137 or search for the keyword *standby* in Windows Help and Support for information on power management modes.

Hard Drive Problems

RUN CHECK DISK —

Windows Vista

1 Click **Start** and click **Computer**.

2 Right-click **Local Disk C:**.

3 Click **Properties**→ **Tools**→ **Check Now**.

The **User Account Control** window may appear. If you are an administrator on the computer, click **Continue**; otherwise, contact your administrator to continue the desired action.

4 Follow the instructions on the screen.

Windows XP

1 Click **Start** and click **My Computer**.

2 Right-click **Local Disk C:**.

3 Click **Properties**→ **Tools**→ **Check Now**.

4 Click **Scan for and attempt recovery of bad sectors** and click **Start**.

E-Mail, Modem, and Internet Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTE: If your computer has a modem, connect the modem to an analog telephone jack only. The modem does not operate while it is connected to a digital telephone network.

NOTE: Do not plug a telephone cable into the network adapter connector. See the documentation shipped came with your computer.

CHECK THE MICROSOFT OUTLOOK® EXPRESS SECURITY SETTINGS — If you cannot open your e-mail attachments:

1 In Outlook Express, click **Tools**→ **Options**→ **Security**.

2 Click **Do not allow attachments** to remove the checkmark, as needed.

CHECK THE TELEPHONE LINE CONNECTION
CHECK THE TELEPHONE JACK
CONNECT THE MODEM DIRECTLY TO THE TELEPHONE WALL JACK
USE A DIFFERENT TELEPHONE LINE —

- Verify that the telephone line is connected to the jack on the modem (the jack has either a green label or a connector-shaped icon next to it).
- Ensure that you hear a click when you insert the telephone line connector into the modem.
- Disconnect the telephone line from the modem and connect it to a telephone, then listen for a dial tone.

- If you have other telephone devices sharing the line, such as an answering machine, fax machine, surge protector, or line splitter, bypass them and use the telephone to connect the modem directly to the telephone wall jack. If you are using a line that is 3 meters (10 feet) or more in length, try a shorter one.

IF YOUR COMPUTER HAS A MODEM, RUN THE MODEM DIAGNOSTIC TOOL —

1. Click **Start**→ **All Programs**→ **Modem Helper** or **Modem Diagnostic Tool**.
2. Follow the instructions on the screen to identify and resolve modem problems. Modem Helper is not available on certain computers.

VERIFY THAT THE MODEM IS COMMUNICATING WITH WINDOWS —

Windows Vista

1. Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Phone and Modem Options**→ **Modems**.
2. Click the COM port for your modem→ **Properties** → **Diagnostics**→ **Query Modem** to verify that the modem is communicating with Windows.

   If all commands receive responses, the modem is operating properly.

Windows XP

1. Click **Start**→ **Control Panel**→ **Printers and Other Hardware**→ **Phone and Modem Options**→ **Modems**.
2. Click the COM port for your modem→ **Properties**→ **Diagnostics**→ **Query Modem** to verify that the modem is communicating with Windows.

   If all commands receive responses, the modem is operating properly.

ENSURE THAT YOU ARE CONNECTED TO THE INTERNET — Ensure that you have subscribed to an Internet provider. With the Outlook Express e-mail program open, click **File**. If **Work Offline** has a checkmark next to it, click the checkmark to remove it and connect to the Internet. For help, contact your Internet service provider.

Error Messages

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

If the error message is not listed, see the documentation for the operating system or the program that was running when the message appeared.

A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? “ < > | — Do not use these characters in filenames.

A REQUIRED .DLL FILE WAS NOT FOUND — The program that you are trying to open

is missing an essential file. To remove and then reinstall the program:

Windows Vista

1 Click **Start** → **Control Panel**→ **Programs**→ **Programs and Features**.
2 Select the program you want to remove.
3 Click **Uninstall**.
4 See the program documentation for installation instructions.

Windows XP

1 Click **Start**→ **Control Panel**→ **Add or Remove Programs**→ **Programs and Features**.
2 Select the program you want to remove.
3 Click **Uninstall**.
4 See the program documentation for installation instructions.

drive letter **:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY —** The drive cannot read the disk. Insert a disk into the drive and try again.

INSERT BOOTABLE MEDIA — Insert a bootable CD or DVD.

NOT ENOUGH MEMORY OR RESOURCES. CLOSE SOME PROGRAMS AND TRY AGAIN — Close all windows and open the program that you want to use. In some cases, you may have to restart your computer to restore computer resources. If so, run the program that you want to use first.

OPERATING SYSTEM NOT FOUND — Contact Dell (see"Contacting Dell" on page 337).

IEEE 1394 Device Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTE: Your computer supports only IEEE 1394a standard.

ENSURE THAT THE CABLE FOR THE IEEE 1394 DEVICE IS PROPERLY INSERTED INTO THE DEVICE AND INTO THE CONNECTOR ON THE COMPUTER

ENSURE THAT THE IEEE 1394 DEVICE IS ENABLED IN SYSTEM SETUP — See "Working With Options on the System Setup Program Screen" on page 308.

ENSURE THAT THE IEEE 1394 DEVICE IS RECOGNIZED BY WINDOWS —

Windows Vista

1 Click **Start** → **Control Panel**→ **Hardware and Sound**.
2 Click **Device Manager.**

If your IEEE 1394 device is listed, Windows recognizes the device.

Windows XP

1 Click **Start** and click **Control Panel**.
2 Under **Pick a Category**, click **Performance and Maintenance**→ **System**→ **System Properties**→ **Hardware**→ **Device Manager**.

IF YOU HAVE PROBLEMS WITH A DELL IEEE 1394 DEVICE — Contact Dell (see "Contacting Dell" on page 337).

IF YOU HAVE PROBLEMS WITH AN IEEE 1394 DEVICE NOT PROVIDED BY DELL —

Contact the IEEE 1394 device manufacturer.

Keyboard Problems for External Keyboards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

CHECK THE KEYBOARD CABLE —

- Ensure that the keyboard cable is firmly connected to the computer.
- Shut down the computer (see the documentation shipped with your computer), reconnect the keyboard cable as shown on the setup diagram for your computer, and then restart the computer.
- Ensure that the cable is not damaged or frayed and check cable connectors for bent or broken pins. Straighten any bent pins.
- Remove any keyboard extension cables and connect the keyboard directly to the computer.

TEST THE KEYBOARD — Connect a properly working keyboard to the computer, then try using the keyboard.

RUN THE HARDWARE TROUBLESHOOTER — See "Windows Hardware Troubleshooter" on page 280.

Lockups and Software Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

The Computer Does not Start up

CHECK THE DIAGNOSTIC LIGHTS — See "Power Lights for Desktop Computers" on page 273 or "Diagnostic Lights for Desktop Computers" on page 274 or "Diagnostic Lights for Laptop Computers" on page 275.

ENSURE THAT THE POWER CABLE IS FIRMLY CONNECTED TO THE COMPUTER AND TO THE ELECTRICAL OUTLET

The Computer Stops Responding

NOTICE: You may lose data if you are unable to perform an operating system shutdown.

TURN THE COMPUTER OFF — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer.

A Program Stops Responding

END THE PROGRAM —

1. Press <Ctrl><Shift><Esc> simultaneously to access the Task Manager.
2. Click the **Applications** tab.
3. Click to select the program that is no longer responding.
4. Click **End Task**.

A Program Crashes Repeatedly

NOTE: Most software includes installation instructions in its documentation or on a CD or DVD.

CHECK THE SOFTWARE DOCUMENTATION — If necessary, uninstall and then reinstall the program.

A Program is Designed for an Earlier Windows Operating System

RUN THE PROGRAM COMPATIBILITY WIZARD —

Windows Vista

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-Windows Vista operating system environments.

1. Click **Start** → **Control Panel**→ **Programs**→ **Programs and Features**→ **Use an older program with this version of Windows.**
2. In the welcome screen, click **Next**.
3. Follow the instructions on the screen.

Windows XP

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-XP operating system environments.

1 Click **Start** → **All Programs**→ **Accessories**→ **Program Compatibility Wizard**→ **Next**.
2 Follow the instructions on the screen.
3 A solid blue screen appears

TURN THE COMPUTER OFF — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer. See "Contacting Dell" on page 337.

Other Software Problems

CHECK THE SOFTWARE DOCUMENTATION OR CONTACT THE SOFTWARE MANUFACTURER FOR TROUBLESHOOTING INFORMATION —

- Ensure that the program is compatible with the operating system installed on your computer.
- Ensure that your computer meets the minimum hardware requirements needed to run the software. See the software documentation for information.
- Ensure that the program is installed and configured properly.
- Verify that the device drivers do not conflict with the program.
- If necessary, uninstall and then reinstall the program.

BACK UP YOUR FILES IMMEDIATELY

USE A VIRUS-SCANNING PROGRAM TO CHECK THE HARD DRIVE, CDS, OR DVDS

SAVE AND CLOSE ANY OPEN FILES OR PROGRAMS AND SHUT DOWN YOUR COMPUTER THROUGH THE START MENU

Memory Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

IF YOU RECEIVE AN INSUFFICIENT MEMORY MESSAGE —

- Save and close any open files and exit any open programs you are not using to see if that resolves the problem.

- See the software documentation for minimum memory requirements. If necessary, install additional memory (see the documentation shipped with your computer).
- Reseat the memory modules (see the documentation shipped with your computer) to ensure that your computer is successfully communicating with the memory.
- Run the Dell Diagnostics (see"Running the Dell Diagnostics" on page 281).

IF YOU EXPERIENCE OTHER MEMORY PROBLEMS —

- Reseat the memory modules (see the documentation shipped with your computer) to ensure that your computer is successfully communicating with the memory.
- Ensure that you are following the memory installation guidelines (see the documentation shipped with your computer).
- Ensure that the memory you are using is supported by your computer. For more information about the type of memory supported by your computer, see the documentation shipped with your computer.
- Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

Mouse Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

CHECK THE MOUSE CABLE —

- Ensure that the cable is not damaged or frayed and check cable connectors for bent or broken pins. Straighten any bent pins.
- Remove any mouse extension cables, and connect the mouse directly to the computer.
- Verify that the mouse cable is connected as shown on the setup diagram for your computer.

RESTART THE COMPUTER —

1. Simultaneously press <Ctrl><Esc> to display the **Start** menu.
2. Press <u>, press the up- and down-arrow keys to highlight **Shut down** or **Turn Off**, and then press <Enter>.
3. After the computer turns off, reconnect the mouse cable as shown on the setup diagram.
4. Turn on the computer.

TEST THE MOUSE — Connect a properly working mouse to the computer, then try using the mouse.

CHECK THE MOUSE SETTINGS —

Windows Vista

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Mouse**.

2 Adjust the settings as needed.

Windows XP

1 Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Mouse**.

2 Adjust the settings as needed.

REINSTALL THE MOUSE DRIVER — See "Installing Drivers for Media Drives" on page 79.

RUN THE HARDWARE TROUBLESHOOTER — See "Windows Hardware Troubleshooter" on page 280.

Network Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

CHECK THE NETWORK CABLE CONNECTOR — Ensure that the network cable is firmly inserted into the network connector on the back of the computer and the network jack.

CHECK THE NETWORK LIGHTS ON THE BACK OF THE COMPUTER — If the link integrity light is off (see the *Service Manual* for your computer or see "Diagnostic Lights for Laptop Computers" on page 275), no network communication is occurring. Replace the network cable.

RESTART THE COMPUTER AND LOG ON TO THE NETWORK AGAIN

CHECK YOUR NETWORK SETTINGS — Contact your network administrator or the person who set up your network to verify that your network settings are correct and that the network is functioning.

RUN THE HARDWARE TROUBLESHOOTER — See "Windows Hardware Troubleshooter" on page 280.

Power Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

IF THE POWER LIGHT IS BLUE AND THE COMPUTER IS NOT RESPONDING — See "Power Lights for Desktop Computers" on page 273 or "Diagnostic Lights for Laptop

Computers" on page 275.

NOTE: On certain systems the power light is green.

IF THE POWER LIGHT IS BLINKING BLUE — The computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.

NOTE: On certain systems the power light is green.

IF THE POWER LIGHT IS OFF — The computer is either turned off or is not receiving power.

- Reseat the power cable in the power connector on the back of the computer and the electrical outlet.
- Replace power strips, power extension cables, and other power protection devices with similar in known working condition to verify that the computer turns on properly.
- Ensure that any power strips being used are plugged into an electrical outlet and are turned on.
- Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
- Ensure that the main power cable and front panel cable are securely connected to the system board (see the *Service Manual* for your computer).

IF THE POWER LIGHT IS BLINKING AMBER — The computer is receiving electrical power, but an internal power problem may exist.

- Ensure that the voltage selection switch is set to match the AC power at your location (if applicable).
- Ensure that all components and cables are properly installed and securely connected to the system board (see the *Service Manual* for your computer).

IF THE POWER LIGHT IS STEADY AMBER — A device may be malfunctioning or incorrectly installed.

- Ensure that the processor power cable is securely connected to the system board power connector (POWER2) (see the *Service Manual* for your computer).
- Remove and then reinstall all memory modules (see the documentation shipped with your computer).
- Remove and then reinstall any expansion cards, including graphics cards (see the documentation shipped with your computer).

ELIMINATE INTERFERENCE — Some possible causes of interference are:

- Power, keyboard, and mouse extension cables
- Too many devices connected to the same power strip

- Multiple power strips connected to the same electrical outlet

Printer Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTE: If you need technical assistance for your printer, contact the printer's manufacturer.

CHECK THE PRINTER DOCUMENTATION — See the printer documentation for setup and troubleshooting information.

ENSURE THAT THE PRINTER IS TURNED ON

CHECK THE PRINTER CABLE CONNECTIONS —

- See the printer documentation for cable connection information.
- Ensure that the printer cables are securely connected to the printer and the computer.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

VERIFY THAT THE PRINTER IS RECOGNIZED BY WINDOWS —

Windows Vista

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Printers**.

2 If the printer is listed, right-click the printer icon.

3 Click **Properties and click Ports**.

4 Adjust the settings, as needed.

Windows XP

1 Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **View installed printers or fax printers**.

2 If the printer is listed, right-click the printer icon.

3 Click **Properties**→ **Ports**. For a parallel printer, ensure that the **Print to the following port(s):** setting is **LPT1 (Printer Port)**. For a USB printer, ensure that the **Print to the following port(s):** setting is **USB**.

REINSTALL THE PRINTER DRIVER — SEE THE PRINTER DOCUMENTATION FOR INFORMATION ON REINSTALLING THE PRINTER DRIVER. —

Scanner Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTE: If you need technical assistance for your scanner, contact the scanner's manufacturer.

CHECK THE SCANNER DOCUMENTATION — See the scanner documentation for setup and troubleshooting information.

UNLOCK THE SCANNER — Ensure that your scanner is unlocked (if the scanner has a locking tab or button).

RESTART THE COMPUTER AND TRY THE SCANNER AGAIN

CHECK THE CABLE CONNECTIONS —

- See the scanner documentation for information on cable connections.
- Ensure that the scanner cables are securely connected to the scanner and the computer.

VERIFY THAT THE SCANNER IS RECOGNIZED BY MICROSOFT WINDOWS —

Windows Vista

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Scanners and Cameras**.

2 If the scanner is listed, Windows recognizes the scanner.

Windows XP

1 Click **Start** → **Control Panel**→ **Printers and Other Hardware**→ **Scanners and Cameras**.

2 If your scanner is listed, Windows recognizes the scanner.

REINSTALL THE SCANNER DRIVER — See the scanner documentation for instructions.

Sound and Speaker Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

No Sound From Speakers

NOTE: The volume control in MP3 and other media players may override the Windows volume setting. Always check to ensure that the volume on the media player(s) has not been turned down or off.

CHECK THE SPEAKER CABLE CONNECTIONS — Ensure that the speakers are connected as shown on the setup diagram supplied with the speakers. If you purchased a sound card, ensure that the speakers are connected to the card.

ENSURE THAT THE SUBWOOFER AND THE SPEAKERS ARE TURNED ON — See the setup diagram supplied with the speakers. If your speakers have volume controls, adjust the volume, bass, or treble to eliminate distortion.

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

DISCONNECT HEADPHONES FROM THE HEADPHONE CONNECTOR — Sound from the speakers is automatically disabled when headphones are connected to the computer's front-panel headphone connector.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

ELIMINATE POSSIBLE INTERFERENCE — Turn off nearby fans, fluorescent lights, or halogen lamps to check for interference.

RUN THE SPEAKER DIAGNOSTICS

REINSTALL THE SOUND DRIVER — See "Installing Drivers for Media Drives" on page 79.

RUN THE HARDWARE TROUBLESHOOTER — See"Windows Hardware Troubleshooter" on page 280.

No Sound From Headphones

CHECK THE HEADPHONE CABLE CONNECTION — Ensure that the headphone cable is securely inserted into the headphone connector (see the documentation shipped with your computer).

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

Touch Pad or Mouse Problems for Laptop Computers

CHECK THE TOUCH PAD SETTINGS —

1. Click **Start**→ **Control Panel**→ **Printers and Other Hardware**→ **Mouse**.
2. Try adjusting the settings.

CHECK THE MOUSE CABLE — Shut down the computer. Disconnect the mouse cable, check it for damage, and firmly reconnect the cable.

If you are using a mouse extension cable, disconnect it and connect the mouse directly to the computer.

TO VERIFY THAT THE PROBLEM IS WITH THE MOUSE, CHECK THE TOUCH PAD —

1. Shut down the computer.
2. Disconnect the mouse.
3. Turn on the computer.
4. At the Windows desktop, use the touch pad to move the cursor around, select an icon, and open it.

   If the touch pad operates correctly, the mouse may be defective.

CHECK THE SYSTEM SETUP PROGRAM SETTINGS — Verify that the system setup program lists the correct device for the pointing device option. (The computer automatically recognizes a USB mouse without making any setting adjustments.) For more information on using the system setup program, see "System Setup" on page 307.

TEST THE MOUSE CONTROLLER — To test the mouse controller (which affects pointer movement) and the operation of the touch pad or mouse buttons, run the Mouse test in the **Pointing Devices** test group in the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

REINSTALL THE TOUCH PAD DRIVER — See "Installing Drivers for Media Drives" on page 79.

Video and Monitor Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

NOTICE: If your computer came with a PCI graphics card installed, removal of the card is not necessary when installing additional graphics cards; however, the card is required for troubleshooting purposes. If you remove the card, store it in a safe and secure location. For information about your graphics card, go to **support.dell.com.**

The Screen is Blank

NOTE: For troubleshooting procedures, see the monitor's documentation.

The Screen is Difficult to Read

CHECK THE MONITOR CABLE CONNECTION —

- Ensure that the monitor cable is connected to the correct graphics card (for dual graphics card configurations).
- If you are using the optional DVI-to-VGA adapter, ensure that the adapter is correctly attached to the graphics card and monitor.
- Ensure that the monitor cable is connected as shown on the setup diagram for your computer.
- Remove any video extension cables and connect the monitor directly to the computer.
- Swap the computer and monitor power cables to determine if the monitor's power cable is defective.
- Check the connectors for bent or broken pins (it is normal for monitor cable connectors to have missing pins).

CHECK THE MONITOR POWER LIGHT —

- If the power light is lit or blinking, the monitor has power.
- If the power light is off, firmly press the button to ensure that the monitor is turned on.
- If the power light is blinking, press a key on the keyboard or move the mouse to resume normal operation.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

CHECK THE DIAGNOSTIC LIGHTS — See "Power Lights for Desktop Computers" on page 273.

CHECK THE MONITOR SETTINGS — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

MOVE THE SUBWOOFER AWAY FROM THE MONITOR — If your speaker system includes a subwoofer, ensure that the subwoofer is positioned at least 60 centimeters (2 feet) away from the monitor.

MOVE THE MONITOR AWAY FROM EXTERNAL POWER SOURCES — Fans, fluorescent lights, halogen lamps, and other electrical devices can cause the screen image to appear *shaky*. Turn off nearby devices to check for interference.

ROTATE THE MONITOR TO ELIMINATE SUNLIGHT GLARE AND POSSIBLE INTERFERENCE

ADJUST THE WINDOWS DISPLAY SETTINGS —

Windows Vista

1 Click **Start** → **Control Panel**→ **Hardware and Sound**→ **Personalization**→ **Display Settings**.
2 Adjust **Resolution** and **Colors settings,** as needed.
3 3D image quality is poor

Windows XP

1 Click **Start** → **Control Panel**→ **Appearance and Themes**.
2 Select a task you wish to perform or click the **Display** icon.
3 Try different settings for **Color quality** and **Screen resolution**.

CHECK THE GRAPHICS CARD POWER CABLE CONNECTION — Ensure that the power cable for the graphics card(s) is correctly attached to the card.

CHECK THE MONITOR SETTINGS — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

Only Part of the Display is Readable

CONNECT AN EXTERNAL MONITOR —

1 Shut down your computer and connect an external monitor to the computer.
2 Turn on the computer and the monitor and adjust the monitor brightness and contrast controls.

If the external monitor works, the computer display or video controller may be

defective. Contact Dell (see "Contacting Dell" on page 337).

Power Lights

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

The power button light located on the front of the computer illuminates and blinks or remains solid to indicate different states:

- If the power light is blue and the computer is not responding, see "Power Lights for Desktop Computers" on page 273.

  NOTE: On certain systems the power light is green.

- If the power light is blinking blue, the computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.

  NOTE: On certain systems the power light is green.

- If the power light is off, the computer is either turned off or is not receiving power.
  - Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
  - If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on.
  - Replace power protection devices, power strips, and power extension cables with similar in known working condition to verify that the computer turns on properly.
  - Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
  - Ensure that the main power cable and front panel cable are securely connected to the system board (see the *Service Manual* for your computer).
- If the power light is blinking amber, the computer is receiving electrical power, but an internal power problem might exist.

- Ensure that the voltage selection switch is set to match the AC power at your location, if applicable.
- Ensure that the processor power cable is securely connected to the system board (see the *Service Manual* for your computer.)

- If the power light is steady amber, a device may be malfunctioning or incorrectly installed.
  - Remove and then reinstall the memory modules (see the *Documentation* for your computer).
  - Remove and then reinstall any cards (see the *Documentation* for your computer.
- Eliminate interference. Some possible causes of interference are:
  - Power, keyboard, and mouse extension cables
  - Too many devices on a power strip
  - Multiple power strips connected to the same electrical outlet

Dell Technical Update Service

The Dell Technical Update service provides proactive e-mail notification of software and hardware updates for your computer. The service is free and can be customized for content, format, and how frequently you receive notifications.

To enroll for the Dell Technical Update service, go to **support.dell.com/technicalupdate**.

21

System Setup

Viewing System Settings With the System Setup Program

Your operating system may automatically configure most of the options available in the system setup program, thus overriding options that you set through the system setup program.

An exception is the **External Hot Key** option, which you can disable or enable only through the system setup program.

FOR MORE INFORMATION: To learn more about configuring operating system features (system settings), see Windows Help and Support: click **Start** or → **Help and Support**.

Use the system setup program to:

- Change the system configuration information after you add, change, or remove hardware on your computer
- Set or change user-selectable options such as your password
- Verify information about your computer's current configuration, such as the amount of system memory

Run the system setup program to become familiar with your system configuration information and optional settings. Write down the information for future reference.

NOTE: Unless you are an expert computer user or are directed to do so by Dell technical support, do not change the system setup program settings. Certain changes might make your computer work incorrectly.

Entering the System Setup Program

1. Turn on (or restart) your computer.
2. When the DELL™ logo appears, press <F2> immediately.
3. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then, shut down your computer and try again.

Working With Options on the System Setup Program Screen

> **FOR MORE INFORMATION:** To learn more about a specific item on a system setup program screen, highlight the item and see the **Help** area on the screen.

On each screen, the system setup options are listed at the left. To the right of each option is the setting or value for that option.

You can change settings that appear as white type on the screen. Options or values that you cannot change (because they are determined by the computer) appear less bright.

The upper-right corner of the screen displays help information for the currently highlighted option. The lower-right corner displays information about the computer. System setup key functions are listed across the bottom of the screen.

The system setup screens display the current setup information and settings for your computer, such as:

- System configuration
- Boot order
- Boot (start-up) configuration
- Basic device configuration settings
- System security and hard drive password settings

Changing the Boot Sequence

The boot sequence, or boot order, tells the computer where to look to find the software needed to start the operating system. You can control the boot sequence and enable/disable devices using the **Boot Order** page of the system setup program.

NOTE: To change the boot sequence on a one-time-only basis, see "Performing a One-Time Boot" on page 310.

The **Boot Order** page displays a general list of the bootable devices that may be installed in your computer, including but not limited to the following:

- **Diskette Drive**
- **Internal HDD**
- **USB Storage Device**
- **CD/DVD/CD-RW drive**
- **Modular Bay HDD**

NOTE: Only devices that are preceded by a number are bootable.

During the boot routine, the computer starts at the top of the list and scans each enabled device for the operating system start-up files. When the computer finds the files, it stops searching and starts the operating system.

To control the boot devices, select (highlight) a device by pressing the down-arrow or up-arrow key, and then enable or disable the device or change its order in the list.

1. Enter the system setup program.
2. Press the left- and right-arrow keys to highlight the **Boot** tab.
3. Press the up- and down-arrow keys to highlight the **Boot Device Property,** and then press <Enter>.
4. Press the up- and down-arrow keys to select the boot device you want to change, and then press <Enter>.
5. Press <F10> and then press <Enter> to exit the system setup program and resume the boot process.

Boot sequence changes take effect as soon as you save the changes and exit the system setup program.

Performing a One-Time Boot

You can set a one-time-only boot sequence without entering the system setup program.

1 Shut down the computer through the **Start** menu.

2 Turn on the computer. When the DELL logo appears, press <F12> immediately.

   If you wait too long and the Windows logo appears, continue to wait until you see the Windows desktop, then shut down your computer and try again.

3 When the boot device list appears, highlight the device from which you want to boot and press <Enter>.

   The computer boots to the selected device.

The next time you reboot the computer, the previous boot order is restored.

Changing Boot Sequence to a USB Device

1 Connect the USB device to a USB connector.

2 Turn on (or restart) your computer.

3 When `F2 = Setup, F12 = Boot Menu` appears in the upper-right corner of the screen, press <F12>.

   If you wait too long and the operating system logo appears, continue to wait until you see the Windows desktop, then shut down your computer and try again.

4 The **Boot Menu** appears, listing all available boot devices.

5 Use the arrow keys to select the appropriate device (for the current boot only).

NOTE: To boot to a USB device, the device must be bootable. To ensure that a device is bootable, check the device documentation.

Changing the BIOS Settings

The BIOS is a utility that serves as an interface between the computer hardware and the operating system. The BIOS settings may need to be updated for certain hardware replacements.

The system setup program allows you to configure user-selectable options in the BIOS, such as date and time or system password. See "Viewing System Settings With the System Setup Program" on page 307 for more information.

NOTE: Unless you understand what effect the settings have on the computer, do not change the settings for this program.

Viewing the BIOS Settings

1 Open **System Information** by clicking the **Start** button and selecting **All Programs**.

2 Click **Accessories**→ **System Tools** → **System Information**.

3 Locate the **BIOS Version/Date** item in **System Summary**.

This **BIOS Version/Date** item displays the BIOS version and date.

Upgrading the BIOS (Flashing the BIOS)

The BIOS may require flashing when an update is available or when replacing the system board.

NOTE: It is recommended that you review specifics about the BIOS update to determine if it applies to your system. Some updates contain changes that impact only certain configurations, or provide new features that may/may not apply to your environment.

1 Turn on the computer.

2 Locate the BIOS update file for your computer at the Dell Support website at **support.dell.com**.

3 Click **Download Now** to download the file.

4 If the **Export Compliance Disclaimer** window appears, click **Yes, I Accept this Agreement**.

The **File Download** window appears.

5 Click **Save this program to disk**, and then click **OK**.

The **Save In** window appears.

6 Click the down arrow to view the **Save In** menu, select **Desktop**, and then click **Save**.

The file downloads to your desktop.

7 Click **Close** when the **Download Complete** window appears.

   The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

8 Double-click the file icon on the desktop and follow the instructions on the screen.

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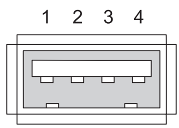
Ports

USB Port

The Universal Serial Bus (USB) is an external bus standard that supports data transfer rates of 480 Mbps in case of USB 2.0. USB gives you a single, standardized way to connect many devices to your computer. USB also supports *Plug-and-Play* installation and *hot swapping*.

The USB standard uses **A** and **B** connectors to avoid confusion:

- Connectors **A** head *upstream* toward the computer.
- Connectors **B** head *downstream* and connect to individual devices.

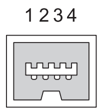


Pin	Signal
1	USB5V+
2	USBP–
3	USBP+
4	GND

IEEE 1394 Port

Like the USB, IEEE 1394 is a serial data transfer protocol and supports hot swapping. While the USB 2.0 technology supports speed only upto 480 Mbps, the IEEE 1394b supports speed upto 800 Mbps. IEEE 1394 is preferred for high bandwidth applications such as connecting digital video cameras and external hard drives.

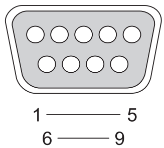
.



Pin	Signal
1	TPB–
2	TPB+
3	TPA–
4	TPA+

RS232 Serial Port

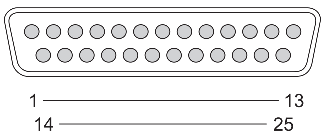
A serial port is a serial communication physical interface through which information transfers in or out one bit at a time. Serial port is usually identified with RS-232 standard compliant hardware. Some of the devices that commonly use serial port are dial-up modems, printers, and serial mice.



Pin	Signal
1	CD
2	RD
3	TD
4	DTR
5	SG
6	DSR
7	RTS
8	CTS
9	RI

Parallel Port

A parallel port is a parallel communication physical interface through which information transfers in or out 8 bits of data (1 byte) at a time. These 8 bits are transmitted parallel to each other, as opposed to the same eight bits being transmitted serially (all in a single row) through a serial port. A parallel port is also known as a printer port or Centronics port and is commonly used to connect to a printer.



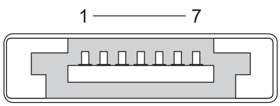
Pin	Signal	Pin	Signal
1	/STROBE	14	/AUTOFD
2	D0	15	/ERROR
3	D1	16	/INIT
4	D2	17	/SELIN
5	D3	18	GND
6	D4	19	GND
7	D5	20	GND
8	D6	21	GND
9	D7	22	GND
10	/ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SEL		

eSATA Port

SATA (Serial Advanced Technology Attachment) is a computer bus primarily designed for transfer of data between a computer and mass storage devices such as hard disk drives and optical drives.

External SATA or eSATA, users can now utilize shielded cable lengths up to 2 meters outside the PC to take advantage of the benefits the SATA interface brings to storage. eSATA provides more performance than existing solutions (up to 6 times faster than existing external storage solutions: USB 2.0, & 1394) and is hot pluggable.

eSATA is commonly used for External Direct Attached Storage for notebooks, desktop, consumer electronics and entry servers.



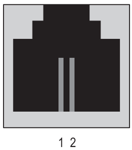
Pin	Signal
1	GND
2	DR+
3	DR-
4	GND
5	DT+
6	DT-
7	GND

Modem

A modem port connects an internal modem to a telephone line. A modem is used to connect a computer to the Internet by making a data call over phone lines to an Internet Service Provider (ISP).

Usually, there are two modem ports side by side. The one marked *line* (or with a line symbol) is connected to the telephone line connector. The one marked *phone* (or with a phone symbol) can optionally be connected to the telephone handset if you want to use a telephone on the same connector.

If your computer does not have an internal modem installed, you will not see these ports. You may also see an ethernet port, see "Ethernet Port" on page 319. It looks similar to a modem port but is wider.



Pin	Signal
1	R-
2	T+

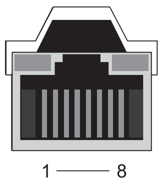
Ethernet Port

An ethernet port uses twisted pair conductors for networking and faster Internet connection.

Cable plugged into this port can lead either to a network hub (a junction box that can wire lots of network cables together), directly to a cable modem, or a DSL modem or to an Internet gateway which shares a fast Internet connection between computers.

Data moves through these at speeds of either 10 Mbps, 100 Mbps, or 1000 Mbps depending on the speed supported by the network card in the computer. When in use, lights on these devices flicker.

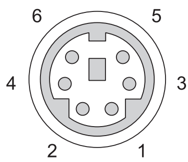
The *ACT* light flickers when data moves through the network to or from the port. The 10 or 100 light denote data speed. *10* denotes data moving across the network at 10 Megabits per second while *100* denotes data moving at 100 Megbits per second.



Pin	Ethernet 10/100 Base - T Signal	Pin	Gigabit Ethernet Signal
1	Transmit +	1	Transmit/Receive 0 +
2	Transmit	2	Transmit/Receive 0 –
3	Receive +	3	Transmit/Receive 1 +
4	NU	4	Transmit/Receive 2 +
5	NU	5	Transmit/Receive 2 –
6	Receive –	6	Transmit/Receive 1 –
7	NU	7	Transmit/Receive 3 +
8	NU	8	Transmit/Receive 3 –

Keyboard and Mouse Port (PS2)

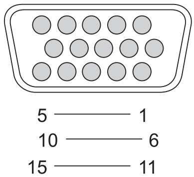
The PS/2 standard, introduced by IBM in 1987, stands for Personal System/2. PS/2 port is commonly used to plug in a keyboard or mouse.



Pin	Signal
1	Keyboard/mouse data
2	(Reserved)
3	Ground
4	Keyboard/mouse power (+5 V)
5	Keyboard/mouse clock
6	(Reserved)

VGA Port

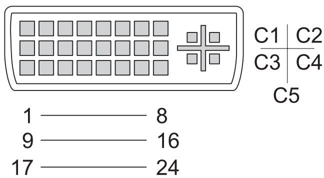
Video Graphics Array (VGA) port supports the basic graphic hardware before a device-specific driver is loaded into the computer.



Pin	Signal	Pin	Signal
1	RED Video	9	DDC 5V+
2	GREEN Video	10	SYNC GND
3	BLUE Video	11	MONITOR_DETECT–
4	NC	12	DDC_DATA (SDA)
5	GND	13	Horizontal SYNC
6	RED Video GND	14	Vertical SYNC
7	GREEN Video GND	15	DDC_CLK (SCL)
8	BLUE Video GND		

DVI-I Port

DVI-I (Digital Video Interface-Integrated) port supports both analog signals and digital signals in a single cable. The cable can transmit either a digital-to-digital signal or an analog-to-analog one, but it will not transmit crossovers of either one (digital-to-analog or analog-to-digital). If you have a DVI-I port on your video card, you can connect most DVI-D (Digital Video Interface-Digital) or DVI-A (Digital Video Interface-Analogue) devices without the need for a separate adapter.

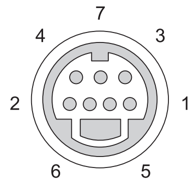


Pin	Signal	Pin	Signal
1	TMDS DATA2–	13	TMDS DATA3+
2	TMDS DATA2+	14	+5V
3	TMDS DATA2/4 SHLD	15	GND (FOR +5V)
4	TMDS DATA4–	16	HOT PLUG DETECT
5	TMDS DATA4+	17	TMDS DATA0–
6	DDC CLK	18	TMDS DATA0+
7	DDC DATA	19	TMDS DATA0/5 SHLD
8	ANALOG VERT SYNC	20	TMDS DATA5–
9	TMDS DATA1–	21	TMDS DATA5+
10	TMDS DATA1+	22	TMDS CLK SHLD
11	TMDS DATA1/3 SHLD	23	TMDS CLK+
12	TMDS DATA3–	24	TMDS CLK–

S-Video TV-Out Port

SUPER Video (S-Video), also known as Y/C is an analog video signal that carries the video data as two separate signals, luma (brightness) and chroma (color). S-Video supports a standard definition video, but does not carry audio on the same cable. S-Video provides sharp images when using a clean DVD source. S-Video commonly connects to consumer TVs, DVD players, high-end video cassette recorders, digital TV receivers, DVRs, and game consoles.

Composite video carries (lower-quality) picture information as a single signal.



S-Video

Pin	Signal
1	GND
2	GND
3	LUMA
4	CHROMA

Composite Video

Pin	Signal
5	GND
6	CVBS
7	NC

Component Video

Component video consists of three signals.

The first is the luminance signal, which indicates brightness or black & white information that is contained in the original RGB (red green blue) signal. It is referred to as the Y component.

The second and third signals are called color difference signals indicating the quantum of blue and red signals compared to luminance. The blue component is Y-B and the red component is Y-R. Green is not transmitted as a separate signal since it can be inferred from the Y, Y-B, and Y-R combination.

Component video inputs are available on modern high-end television sets and DVD players, providing a signal quality that is superior to earlier systems such as RF, composite, and so on.



Pin	Signal
Red	Y-R (Pr)
Blue	Y-B (Pb)
Green	Y

Composite Video

Composite video is an interface for sending or receiving an analog video signal. It is a composite of several signals, LUMA, CHROMA, and SYNC (together referred to as CVSB or Composite Video Blanking and Sync). LUMA represents the brightness or luminance of the picture and includes synchronizing or SYNC pulses. CHROMA carries the color information.

Composite video interface usually connects a VHS tape player, DVD player, or game console to a television.



Composite Video

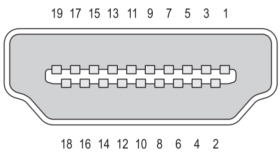
Pin	Signal
1	GND
2	CVBS

HDMI Port

The High-Definition Multimedia Interface (HDMI) PORT is a compact audio/video interface for transmitting uncompressed digital streams.

On a single cable, HDMI supports PC or TV video formats such as standard, enhanced, and high-definition video along with up to 8 channels of digital audio. It is independent of the various digital television standards.

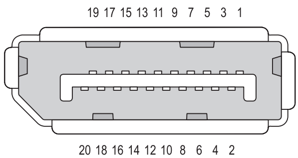
HDMI connects digital audio/video sources such as Blu-ray Disc players, set-top boxes, personal computers, and video game consoles to compatible digital audio devices, computer monitors, and digital televisions.



Pin	Signal	Pin	Signal
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock–
3	TMDS Data2–	13	CEC
4	TMDS Data1+	14	Reserved (N.C. on device)
5	TMDS Data1 Shield	15	SCL
6	TMDS Data1–	16	SDA
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 Shield	18	+5 V Power (max 50 mA)
9	TMDS Data0–	19	Hot Plug Detect
10	TMDS Clock+		

DisplayPort™

DisplayPort is a digital display interface standard put forth by the Video Electronics Standards Association (VESA). It defines a new license-free, royalty-free, digital audio/video interconnect, intended to be used primarily between a computer and its display monitor, or a computer and a home-theater system. For more information see "DisplayPort™ - Features and Benefits" on page 56.



Pin	Signal	Pin	Signal
1	ML_Lane 0(p)	11	GND
2	GND	12	ML_Lane 3(n)
3	ML_Lane 0(n)	13	GND
4	ML_Lane 1(p)	14	GND
5	GND	15	AUX_CH(p)
6	ML_Lane 1(n)	16	GND
7	ML_Lane 2(p)	17	AUX_CH(n)
8	GND	18	Hot Plug
9	ML_Lane 2(n)	19	DP_PWR Return
10	ML_Lane 3(p)	20	DP_PWR

S/PDIF Port (Coaxial RCA)

Sony/**P**hilips **D**igital **I**nterconnect **F**ormat (S/PDIF) is a serial interface for transferring digital audio from CD and DVD players to amplifiers and TVs.

S/PDIF uses unbalanced 75 ohm coaxial cable up to 10 meters with coaxial RCA connectors or optical fiber terminated with a Toslink (Toshiba link) connector.

NOTE: There are no differences in the signals transmitted over optical or coaxial S/PDIF connectors—both carry exactly the same information.

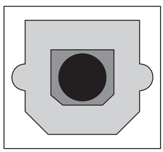
S/PDIF is typically used to transmit PCM and Dolby Digital 5.1, but is not tied to any sampling rate or audio standard.



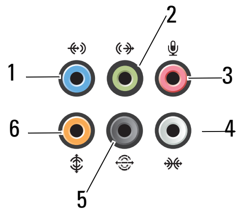
S/PDIF Port (Toslink)

Toslink usually refers to the optical version of S/PDIF.

NOTE: There are no differences in the signals transmitted over optical or coaxial S/PDIF connectors—both carry exactly the same information.



Audio Ports



Port	Signal	Connection
1	line-in connector	Use the (blue) line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. On computers with a sound card, use the connector on the card.
2	lineout/ headphone connector	Use the (green) line-out connector to attach headphones and speakers with integrated amplifiers.
3	microphone connector	Use the (pink) microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program.
4	side surround sound connector	Use the (silver) side surround connector to attach additional speakers.
5	rear surround out	Use the (black) surround sound connector to attach multichannel-capable speakers.
6	center/LFE surround out	Use the (orange) subwoofer connector to attach a single subwoofer.

NOTE: The LFE (Low Frequency Effects) Audio channel, found in digital surround sound audio schemes, carries only low frequency information of 80 Hz and below. The LFE channel drives a subwoofer to provide extremely low bass extension. Systems not using subwoofers can shunt the LFE information to the main speakers in the surround sound setup.

23

Getting Help



Obtaining Assistance

CAUTION: Before working inside your computer, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

If you experience a problem with your computer, complete the following steps to troubleshoot and diagnose the problem:

1 See "Troubleshooting" on page 271 for information and procedures that pertain to the problem your computer is experiencing.

2 Run the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

3 Fill out the "Diagnostics Checklist" on page 336. This checklist helps you to organize information Dell's support services will need to troubleshoot your computer.

4 Use Dell's extensive suite of online services available at Dell Support (**support.dell.com**) for help with installation and troubleshooting procedures. See "Online Services" on page 333 for a more extensive list of Dell Support online services and features.

5 If the preceding steps have not resolved the problem, see "Contacting Dell" on page 337.

NOTE: Call Dell Support from a telephone at or near the computer so that the support staff can assist you with any necessary procedures.

NOTE: Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using Dell Support, see "Technical Support and Customer Service" on page 332.

Dell Support Service

NOTE: Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Technical Support and Customer Service

Dell's support service is available to answer your questions about Dell™ hardware. Our support staff uses special diagnostic utilities to provide fast, accurate answers.

To contact Dell's support service, see "Before You Call" on page 335, and then see the contact information for your region or go to **support.dell.com**.

DellConnect™

DellConnect is a simple online access tool that allows a Dell service and support associate to access your computer through a broadband connection, diagnose your problem and repair it all under your supervision. For more information, go to **support.dell.com** and click **DellConnect**.

Online Services

You can learn about Dell products and services on the following websites:

www.dell.com

www.dell.com/ap (Asian/Pacific countries only)

www.dell.com/jp (Japan only)

www.euro.dell.com (Europe only)

www.dell.com/la (Latin American and Caribbean countries)

www.dell.ca (Canada only)

You can access Dell Support through the following websites and e-mail addresses:

- **Dell Support websites**

  support.dell.com

  support.jp.dell.com (Japan only)

  support.euro.dell.com (Europe only)

- **Dell Support e-mail addresses**

  mobile_support@us.dell.com

  support@us.dell.com

  la-techsupport@dell.com (Latin America and Caribbean countries only)

  apsupport@dell.com (Asian/Pacific countries only)

- **Dell Marketing and Sales e-mail addresses**

  apmarketing@dell.com (Asian/Pacific countries only)

  sales_canada@dell.com (Canada only)

- **Anonymous file transfer protocol** (FTP)

  ftp.dell.com

  Log in as user: `anonymous`, and use your e-mail address as your password.

AutoTech Service

Dell's automated support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their laptop and desktop computers.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions. For the telephone number to call for your region, see "Contacting Dell" on page 337.

Automated Order-Status Service

To check on the status of any Dell products you have ordered, you can go to **support.dell.com**, or you can call the automated order-status service. A recorded message prompts you for the information needed to locate and report on your order. For the telephone number to call for your region, see "Contacting Dell" on page 337.

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip handy when you call. For information on the telephone number to call for your region, see "Contacting Dell" on page 337.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at **www.dell.com**. For information on the telephone number to call for your region or to speak to a sales specialist, see "Contacting Dell" on page 337.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.

   For information on the telephone number to call for your region, see "Contacting Dell" on page 337.

2. Include a copy of the invoice and a letter describing the reason for the return.

3 Include a copy of the Diagnostics Checklist (see "Diagnostics Checklist" on page 336), indicating the tests that you have run and any error messages reported by the Dell Diagnostics (see "Running the Dell Diagnostics" on page 281).

4 Include any accessories that belong with the item(s) being returned (power cables, software, guides, and so on) if the return is for credit.

5 Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect On Delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at Dell's receiving dock and returned to you.

Retail Customers

Systems purchased from a retailer are subject to the retailer's return policy.

Before You Call

NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently. You may also be asked for your Service Tag (typically located on the bottom or back of your computer).

Remember to fill out the Diagnostics Checklist (see "Diagnostics Checklist" on page 336). If possible, turn on your computer before you call Dell for assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer itself. Ensure that the computer documentation is available.

CAUTION: Before working inside your computer, follow the safety instructions shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

Diagnostics Checklist

Name:

Date:

Address:

Phone number:

Service Tag (bar code on the bottom or back of your computer):

Express Service Code:

Return Material Authorization Number (if provided by Dell support technician):

Operating system and version:

Devices:

Expansion cards:

Are you connected to a network? Yes No

Network, version, and network adapter:

Programs and versions:

See your operating system documentation to determine the contents of the system's start-up files. If the computer is connected to a printer, print each file. Otherwise, record the contents of each file before calling Dell.

Error message, beep code, or diagnostic code:

Description of problem and troubleshooting procedures you performed:

Contacting Dell

For customers in the United States, call 800-WWW-DELL (800-999-3355).

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit **support.dell.com**.
2. Verify your country or region in the **Choose A Country/Region** drop-down menu at the bottom of the page.
3. Click **Contact Us** on the left side of the page.
4. Select the appropriate service or support link based on your need.
5. Choose the method of contacting Dell that is convenient for you.

Glossary

Terms in this Glossary are provided for informational purposes only and may or may not describe features included with your particular computer.

A

AC — alternating current — The form of electricity that powers your computer when you plug the AC adapter power cable in to an electrical outlet.

ACPI — advanced configuration and power interface — A power management specification that enables Microsoft® Windows® operating systems to put a computer in standby or hibernate mode to conserve the amount of electrical power allocated to each device attached to the computer.

AGP — accelerated graphics port — A dedicated graphics port that allows system memory to be used for video-related tasks. AGP delivers a smooth, true-color video image because of the faster interface between the video circuitry and the computer memory.

AHCI — Advanced Host Controller Interface — An interface for a SATA hard drive Host Controller which allows the storage driver to enable technologies such as Native Command Queuing (NCQ) and hot plug.

ALS — ambient light sensor — A feature that helps to control display brightness.

antivirus software — A program designed to identify, quarantine, and/or delete viruses from your computer.

ASF — alert standards format — A standard to define a mechanism for reporting hardware and software alerts to a management console. ASF is designed to be platform- and operating system-independent.

B

battery life span — The length of time (years) during which a laptop computer battery is able to be depleted and recharged.

battery operating time — The length of time (minutes or hours) that a laptop computer battery powers the computer.

BIOS — basic input/output system — A program (or utility) that serves as an interface between the computer hardware and the operating system. Unless you understand what effect these settings have on the computer, do not change them. Also referred to as *system setup*.

bit — The smallest unit of data interpreted by your computer.

Bluetooth® wireless technology — A wireless technology standard for short-range (9 m [29 feet]) networking devices that allows for enabled devices to automatically recognize each other.

boot sequence — Specifies the order of the devices from which the computer attempts to boot.

bootable CD — A CD that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD available. Your *Drivers and Utilities* (or *ResourceCD*) is a bootable CD.

bootable disk — A disk that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD available.

bps — bits per second — The standard unit for measuring data transmission speed.

BTU — British thermal unit — A measurement of heat output.

bus — A communication pathway between the components in your computer.

bus speed — The speed, given in MHz, that indicates how fast a bus can transfer information.

byte — The basic data unit used by your computer. A byte is usually equal to 8 bits.

C

C — Celsius — A temperature measurement scale where 0° is the freezing point and 100° is the boiling point of water.

cache — A special high-speed storage mechanism which can be either a reserved section of main memory or an independent high-speed storage device. The cache enhances the efficiency of many processor operations.

L1 cache — Primary cache stored inside the processor.

L2 cache — Secondary cache which can either be external to the processor or incorporated into the processor architecture.

carnet — An international customs document that facilitates temporary imports into foreign countries. Also known as a *merchandise passport*.

CD-R — CD recordable — A recordable version of a CD. Data can be recorded only once onto a CD-R. Once recorded, the data cannot be erased or written over.

CD-RW — CD rewritable — A rewritable version of a CD. Data can be written to a CD-RW disc, and then erased and written over (rewritten).

CD-RW drive — A drive that can read CDs and write to CD-RW (rewritable CDs)

and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

CD-RW/DVD drive — A drive, sometimes referred to as a combo drive, that can read CDs and DVDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

clock speed — The speed, given in MHz, that indicates how fast computer components that are connected to the system bus operate.

COA — Certificate of Authenticity — The Windows alpha-numeric code located on a sticker on your computer. Also referred to as the *Product Key* or *Product ID*.

Control Panel — A Windows utility that allows you to modify operating system and hardware settings, such as display settings.

controller — A chip that controls the transfer of data between the processor and memory or between the processor and devices.

CRIMM — continuity rambus in-line memory module — A special module that has no memory chips and is used to fill unused RIMM slots.

cursor — The marker on a display or screen that shows where the next keyboard, touch pad, or mouse action will occur. It often is a blinking solid line, an underline character, or a small arrow.

D

DDR SDRAM — double-data-rate SDRAM — A type of SDRAM that doubles the data burst cycle, improving system performance.

DDR2 SDRAM — double-data-rate 2 SDRAM — A type of DDR SDRAM that uses a 4-bit prefetch and other architectural changes to boost memory speed to over 400 MHz.

device — Hardware such as a disk drive, printer, or keyboard that is installed in or connected to your computer.

device driver — See *driver*.

DIMM — dual in-line memory module — A circuit board with memory chips that connects to a memory module on the system board.

DIN connector — A round, six-pin connector that conforms to DIN (Deutsche Industrie-Norm) standards; it is typically used to connect PS/2 keyboard or mouse cable connectors.

disk striping — A technique for spreading data over multiple disk drives. Disk striping

can speed up operations that retrieve data from disk storage. Computers that use disk striping generally allow the user to select the data unit size or stripe width.

DMA — direct memory access — A channel that allows certain types of data transfer between RAM and a device to bypass the processor.

DisplayPort — An interface standard of the Video Electronics Standards Association (VESA) used for digital displays.

DMTF — Distributed Management Task Force — A consortium of hardware and software companies who develop management standards for distributed desktop, network, enterprise, and Internet environments.

domain — A group of computers, programs, and devices on a network that are administered as a unit with common rules and procedures for use by a specific group of users. A user logs on to the domain to gain access to the resources.

DRAM — dynamic random-access memory — Memory that stores information in integrated circuits containing capacitors.

driver — Software that allows the operating system to control a device such as a printer. Many devices do not work properly if the correct driver is not installed in the computer.

DSL — Digital Subscriber Line — A technology that provides a constant, high-speed Internet connection through an analog telephone line.

dual-core — A technology in which two physical computational units exist inside a single processor package, thereby increasing computing efficiency and multi-tasking ability.

dual display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *extended display mode*.

DVD-R — DVD recordable — A recordable version of a DVD. Data can be recorded only once onto a DVD-R. Once recorded, the data cannot be erased or written over.

DVD+RW — DVD rewritable — A rewritable version of a DVD. Data can be written to a DVD+RW disc, and then erased and written over (rewritten). (DVD+RW technology is different from DVD-RW technology.)

DVD+RW drive — drive that can read DVDs and most CD media and write to DVD+RW (rewritable DVDs) discs.

DVI — digital video interface — A standard for digital transmission between a computer and a digital video display.

E

ECC — error checking and correction — A type of memory that includes special

circuitry for testing the accuracy of data as it passes in and out of memory.

ECP — extended capabilities port — A parallel connector design that provides improved bidirectional data transmission. Similar to EPP, ECP uses direct memory access to transfer data and often improves performance.

EIDE — enhanced integrated device electronics — An improved version of the IDE interface for hard drives and CD drives.

EMI — electromagnetic interference — Electrical interference caused by electromagnetic radiation.

EPP — enhanced parallel port — A parallel connector design that provides bidirectional data transmission.

ESD — electrostatic discharge — A rapid discharge of static electricity. ESD can damage integrated circuits found in computer and communications equipment.

expansion card — A circuit board that installs in an expansion slot on the system board in some computers, expanding the capabilities of the computer. Examples include video, modem, and sound cards.

expansion slot — A connector on the system board (in some computers) where you insert an expansion card, connecting it to the system bus.

ExpressCard — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of ExpressCards. ExpressCards support both the PCI Express and USB 2.0 standard.

Express Service Code — A numeric code located on a sticker on your Dell™ computer. Use the Express Service Code when contacting Dell for assistance. Express Service Code service may not be available in some countries. Also see Service Tag.

extended display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *dual display mode*.

extended PC Card — A PC Card that extends beyond the edge of the PC Card slot when installed.

F

Fahrenheit — A temperature measurement scale where 32° is the freezing point and 212° is the boiling point of water.

FBD — fully-buffered DIMM — A DIMM with DDR2 DRAM chips and an Advanced Memory Buffer (AMB) that speeds communication between the DDR2 SDRAM chips and the system.

FCC — Federal Communications Commission — A U.S. agency responsible for enforcing communications-related regulations that state how much radiation

computers and other electronic equipment can emit.

fingerprint reader — A strip sensor that uses your unique fingerprint to authenticate your user identity to help secure your computer.

folder — A term used to describe space on a disk or drive where files are organized and grouped. Files in a folder can be viewed and ordered in various ways, such as alphabetically, by date, and by size.

format — The process that prepares a drive or disk for file storage. When a drive or disk is formatted, the existing information on it is lost.

FSB — front side bus — The data path and physical interface between the processor and RAM.

FTP — file transfer protocol — A standard Internet protocol used to exchange files between computers connected to the Internet.

G

G — gravity — A measurement of weight and force.

GB — gigabyte — A measurement of data storage that equals 1024 MB (1,073,741,824 bytes). When used to refer to hard drive storage, the term is often rounded to 1,000,000,000 bytes.

GHz — gigahertz — A measurement of frequency that equals one thousand million Hz, or one thousand MHz. The speeds for computer processors, buses, and interfaces are often measured in GHz.

graphics mode — A video mode that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Graphics modes can display an unlimited variety of shapes and fonts.

GUI — graphical user interface — Software that interacts with the user by means of menus, windows, and icons. Most programs that operate on the Windows operating systems are GUIs.

H

hard drive — A drive that reads and writes data on a hard disk. The terms hard drive and hard disk are often used interchangeably.

heat sink — A metal plate on some processors that helps dissipate heat.

hibernate mode — A power management mode that saves everything in memory to a reserved space on the hard drive and then turns off the computer. When you restart the computer, the memory information that was saved to the hard drive is automatically restored.

HTTP — hypertext transfer protocol — A protocol for exchanging files between computers connected to the Internet.

Hz — hertz — A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IC — integrated circuit — A semiconductor wafer, or chip, on which thousands or millions of tiny electronic components are fabricated for use in computer, audio, and video equipment.

IDE — integrated device electronics — An interface for mass storage devices in which the controller is integrated into the hard drive or CD drive.

IEEE 1394 — Institute of Electrical and Electronics Engineers, Inc. — A high-performance serial bus used to connect IEEE 1394-compatible devices, such as digital cameras and DVD players, to the computer.

infrared sensor — A port that allows you to transfer data between the computer and infrared-compatible devices without using a cable connection.

integrated — Usually refers to components that are physically located on the computer's system board. Also referred to as *built-in*.

I/O — input/output — An operation or device that enters and extracts data from your computer. Keyboards and printers are I/O devices.

I/O address — An address in RAM that is associated with a specific device (such as a serial connector, parallel connector, or expansion slot) and allows the processor to communicate with that device.

IrDA — Infrared Data Association — The organization that creates international standards for infrared communications.

IRQ — interrupt request — An electronic pathway assigned to a specific device so that the device can communicate with the processor. Each device connection must be assigned an IRQ. Although two devices can share the same IRQ assignment, you cannot operate both devices simultaneously.

ISP — Internet service provider — A company that allows you to access its host server to connect directly to the Internet, send and receive e-mail, and access websites. The ISP typically provides you with a software package, user name, and access phone numbers for a fee.

K

Kb — kilobit — A unit of data that equals 1024 bits. A measurement of the capacity of memory integrated circuits.

KB — kilobyte — A unit of data that equals 1024 bytes but is often referred to as 1000 bytes.

key combination — A command requiring you to press multiple keys at the same time.

kHz — kilohertz — A measurement of frequency that equals 1000 Hz.

L

LAN — local area network — A computer network covering a small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD — liquid crystal display — The technology used by laptop computer and flat-panel displays.

LED — light-emitting diode — An electronic component that emits light to indicate the status of the computer.

local bus — A data bus that provides a fast throughput for devices to the processor.

LPT — line print terminal — The designation for a parallel connection to a printer or other parallel device.

M

Mb — megabit — A measurement of memory chip capacity that equals 1024 Kb.

Mbps — megabits per second — One million bits per second. This measurement is typically used for transmission speeds for networks and modems.

MB — megabyte — A measurement of data storage that equals 1,048,576 bytes. 1 MB equals 1024 KB. When used to refer to hard drive storage, the term is often rounded to 1,000,000 bytes.

MB/sec — megabytes per second — One million bytes per second. This measurement is typically used for data transfer ratings.

media bay — A bay that supports devices such as optical drives, a second battery, or a Dell TravelLite™ module.

memory — A temporary data storage area inside your computer. Because the data in

memory is not permanent, it is recommended that you frequently save your files while you are working on them, and always save your files before you shut down the computer. Your computer can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM.

memory address — A specific location where data is temporarily stored in RAM.

memory mapping — The process by which the computer assigns memory addresses to physical locations at start-up. Devices and software can then identify information that the processor can access.

memory module — A small circuit board containing memory chips, which connects to the system board.

MHz — megahertz — A measure of frequency that equals 1 million cycles per second. The speeds for computer processors, buses, and interfaces are often measured in MHz.

Mini PCI — A standard for integrated peripheral devices with an emphasis on communications such as modems and NICs. A Mini PCI card is a small external card that is functionally equivalent to a standard PCI expansion card.

Mini-Card — A small card designed for integrated peripherals, such as communication NICs. The Mini-Card is functionally equivalent to a standard PCI expansion card.

modem — A device that allows your computer to communicate with other computers over analog telephone lines. Three types of modems include: external, PC Card, and internal. You typically use your modem to connect to the Internet and exchange e-mail.

module bay — See *media bay.*

MP — megapixel — A measure of image resolution used for digital cameras.

ms — millisecond — A measure of time that equals one thousandth of a second. Access times of storage devices are often measured in ms.

N

network adapter — A chip that provides network capabilities. A computer may include a network adapter on its system board, or it may contain a PC Card with an adapter on it. A network adapter is also referred to as a *NIC* (network interface controller).

NIC — See *network adapter.*

notification area — The section of the Windows taskbar that contains icons for providing quick access to programs and computer functions, such as the clock, volume control, and print status. Also referred to as *system tray.*

ns — nanosecond — A measure of time that equals one billionth of a second.

NVRAM — nonvolatile random access memory — A type of memory that stores data when the computer is turned off or loses its external power source. NVRAM is used for maintaining computer configuration information such as date, time, and other system setup options that you can set.

O

optical drive — A drive that uses optical technology to read or write data from CDs, DVDs, or DVD+RWs. Example of optical drives include CD drives, DVD drives, CD-RW drives, and CD-RW/DVD combo drives.

P

partition — A physical storage area on a hard drive that is assigned to one or more logical storage areas known as logical drives. Each partition can contain multiple logical drives.

PC Card — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of PC Cards.

PCI — peripheral component interconnect — PCI is a local bus that supports 32-and 64-bit data paths, providing a high-speed data path between the processor and devices such as video, drives, and networks.

PCI Express — A modification to the PCI interface that boosts the data transfer rate between the processor and the devices attached to it. PCI Express can transfer data at speeds from 250 MB/sec to 4 GB/sec. If the PCI Express chip set and the device are capable of different speeds, they will operate at the slower speed.

PCMCIA — Personal Computer Memory Card International Association — The organization that establishes standards for PC Cards.

PIO — programmed input/output — A method of transferring data between two devices through the processor as part of the data path.

pixel — A single point on a display screen. Pixels are arranged in rows and columns to create an image. A video resolution, such as 800 x 600, is expressed as the number of pixels across by the number of pixels up and down.

Plug-and-Play — The ability of the computer to automatically configure devices. Plug and Play provides automatic installation, configuration, and compatibility with existing hardware if the BIOS, operating system, and all devices are Plug and Play compliant.

POST — power-on self-test — Diagnostics programs, loaded automatically by the

BIOS, that perform basic tests on the major computer components, such as memory, hard drives, and video. If no problems are detected during POST, the computer continues the start-up.

processor — A computer chip that interprets and executes program instructions. Sometimes the processor is referred to as the CPU (central processing unit).

PS/2 — personal system/2 — A type of connector for attaching a PS/2-compatible keyboard, mouse, or keypad.

PXE — pre-boot execution environment — A WfM (Wired for Management) standard that allows networked computers that do not have an operating system to be configured and started remotely.

R

RAID — redundant array of independent disks — A method of providing data redundancy. Some common implementations of RAID include RAID 0, RAID 1, RAID 5, RAID 10, and RAID 50.

RAM — random-access memory — The primary temporary storage area for program instructions and data. Any information stored in RAM is lost when you shut down your computer.

readme file — A text file included with a software package or hardware product. Typically, readme files provide installation information and describe new product enhancements or corrections that have not yet been documented.

read-only — Data and/or files you can view but cannot edit or delete. A file can have read-only status if:

- It resides on a physical CD or DVD.
- It is located on a network in a directory and the system administrator has assigned rights only to specific individuals.

refresh rate — The frequency, measured in Hz, at which your screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye.

resolution — The sharpness and clarity of an image produced by a printer or displayed on a monitor. The higher the resolution, the sharper the image.

RFI — radio frequency interference — Interference that is generated at typical radio frequencies, in the range of 10 kHz to 100,000 MHz. Radio frequencies are at the lower end of the electromagnetic frequency spectrum and are more likely to have interference than the higher frequency radiations, such as infrared and light.

ROM — read-only memory — Memory that stores data and programs that cannot be deleted or written to by the computer. ROM, unlike RAM, retains its contents after

you shut down your computer. Some programs essential to the operation of your computer reside in ROM.

RPM — revolutions per minute — The number of rotations that occur per minute. Hard drive speed is often measured in rpm.

RTC — real time clock — Battery-powered clock on the system board that keeps the date and time after you shut down the computer.

RTCRST — real-time clock reset — A jumper on the system board of some computers that can often be used for troubleshooting problems.

S

SAS — serial attached SCSI — A faster, serial version of the SCSI interface (as opposed to the original SCSI parallel architecture).

SATA — serial ATA — A faster, serial version of the ATA (IDE) interface.

ScanDisk — A Microsoft utility that checks files, folders, and the hard disk's surface for errors. ScanDisk often runs when you restart the computer after it has stopped responding.

SCSI — small computer system interface — A high-speed interface used to connect devices to a computer, such as hard drives, CD drives, printers, and scanners. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

SDRAM — synchronous dynamic random-access memory — A type of DRAM that is synchronized with the optimal clock speed of the processor.

serial connector — An I/O port often used to connect devices such as a handheld digital device or digital camera to your computer.

Service Tag — A bar code label on your computer that identifies your computer when you access Dell Support at **support.dell.com** or when you call Dell for customer service or technical support. Also see **Express Service Code.**

setup program — A program that is used to install and configure hardware and software. The **setup.exe** or **install.exe** program comes with most Windows software packages. *Setup program* differs from *system setup*.

shortcut — An icon that provides quick access to frequently used programs, files, folders, and drives. When you place a shortcut on your Windows desktop and double-click the icon, you can open its corresponding folder or file without having to find it first. Shortcut icons do not change the location of files. If you delete a shortcut, the original file is not affected. Also, you can rename a shortcut icon.

SIM — Subscriber Identity Module — A SIM card contains a microchip that encrypts voice and data transmissions. SIM cards can be used in phones or laptop computers.

smart card — A card that is embedded with a processor and a memory chip. Smart cards can be used to authenticate a user on computers equipped for smart cards.

S/PDIF — Sony/Philips Digital Interface — An audio transfer file format that allows the transfer of audio from one file to another without converting it to and from an analog format, which could degrade the quality of the file.

standby mode — A power management mode that shuts down all unnecessary computer operations to save energy.

Strike Zone™ — Reinforced area of the platform base that protects the hard drive by acting as a dampening device when a computer experiences resonating shock or is dropped (whether the computer is on or off).

surge protectors — Prevent voltage spikes, such as those that may occur during an electrical storm, from entering the computer through the electrical outlet. Surge protectors do not protect against lightning strikes or against brownouts, which occur when the voltage drops more than 20 percent below the normal AC-line voltage level.

Network connections cannot be protected by surge protectors. Always disconnect the network cable from the network connector during electrical storms.

SVGA — super-video graphics array — A video standard for video cards and controllers. Typical SVGA resolutions are 800 x 600 and 1024 x 768.

The number of colors and resolution that a program displays depends on the capabilities of the monitor, the video controller and its drivers, and the amount of video memory installed in the computer.

S-video TV-out — A connector used to attach a TV or digital audio device to the computer.

SXGA — super-extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 1024.

SXGA+ — super-extended graphics array plus — A video standard for video cards and controllers that supports resolutions up to 1400 x 1050.

system board — The main circuit board in your computer. Also known as the *motherboard*.

system setup — A utility that serves as an interface between the computer hardware and the operating system. System setup allows you to configure user-selectable options in the BIOS, such as date and time or system password. Unless you understand what effect the settings have on the computer, do not change the settings for this program.

T

TAPI — telephony application programming interface — Enables Windows programs to operate with a wide variety of telephony devices, including voice, data, fax, and

video.

text editor — A program used to create and edit files that contain only text; for example, Windows Notepad uses a text editor. Text editors do not usually provide word wrap or formatting functionality (the option to underline, change fonts, and so on).

TPM — trusted platform module — A hardware-based security feature that when combined with security software enhances network and computer security by enabling features such as file and e-mail protection.

travel module — A plastic device designed to fit inside the module bay of a laptop computer to reduce the weight of the computer.

U

UMA — unified memory allocation — System memory dynamically allocated to video.

UPS — uninterruptible power supply — A backup power source used when the electrical power fails or drops to an unacceptable voltage level. A UPS keeps a computer running for a limited amount of time when there is no electrical power. UPS systems typically provide surge suppression and may also provide voltage regulation. Small UPS systems provide battery power for a few minutes to enable you to shut down your computer.

USB — universal serial bus — A hardware interface for a low-speed device such as a USB-compatible keyboard, mouse, joystick, scanner, set of speakers, printer, broadband devices (DSL and cable modems), imaging devices, or storage devices. Devices are plugged directly in to a 4-pin socket on your computer or in to a multi-port hub that plugs in to your computer. USB devices can be connected and disconnected while the computer is turned on, and they can also be daisy-chained together.

UTP — unshielded twisted pair — Describes a type of cable used in most telephone networks and some computer networks. Pairs of unshielded wires are twisted to protect against electromagnetic interference, rather than relying on a metal sheath around each pair of wires to protect against interference.

UXGA — ultra extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1600 x 1200.

V

video controller — The circuitry on a video card or on the system board (in computers with an integrated video controller) that provides the video capabilities—in combination with the monitor—for your computer.

video memory — Memory that consists of memory chips dedicated to video functions. Video memory is usually faster than system memory. The amount of video memory installed primarily influences the number of colors that a program can display.

video mode — A mode that describes how text and graphics are displayed on a monitor. Graphics-based software, such as Windows operating systems, displays in video modes that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Character-based software, such as text editors, displays in video modes that can be defined as *x* columns by *y* rows of characters.

video resolution — See *resolution*.

virus — A program that is designed to inconvenience you or to destroy data stored on your computer. A virus program moves from one computer to another through an infected disk, software downloaded from the Internet, or e-mail attachments. When an infected program starts, its embedded virus also starts.

V — volt — The measurement of electric potential or electromotive force. One V appears across a resistance of 1 ohm when a current of 1 ampere flows through that resistance.

W

W — watt — The measurement of electrical power. One W is 1 ampere of current flowing at 1 volt.

WHr — watt-hour — A unit of measure commonly used to indicate the approximate capacity of a battery. For example, a 66-WHr battery can supply 66 W of power for 1 hour or 33 W for 2 hours.

wallpaper — The background pattern or picture on the Windows desktop. Change your wallpaper through the Windows Control Panel. You can also scan in your favorite picture and make it wallpaper.

WLAN — wireless local area network. A series of interconnected computers that communicate with each other over the air waves using access points or wireless routers to provide Internet access.

write-protected — Files or media that cannot be changed. Use write-protection when you want to protect data from being changed or destroyed.

WWAN — wireless wide area network. A wireless high-speed data network using cellular technology and covering a much larger geographic area than WLAN.

WXGA — wide-aspect extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 800.

X

XGA — extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1024 x 768.

Z

ZIF — zero insertion force — A type of socket or connector that allows a computer chip to be installed or removed with no stress applied to either the chip or its socket.

Zip — A popular data compression format. Files that have been compressed with the Zip format are called Zip files and usually have a filename extension of**.zip**. A special kind of zipped file is a self-extracting file, which has a filename extension of**.exe**. You can unzip a self-extracting file by double-clicking it.

Zip drive — A high-capacity floppy drive developed by Iomega Corporation that uses 3.5-inch removable disks called Zip disks. Zip disks are slightly larger than regular floppy disks, about twice as thick, and hold up to 250 MB of data.